

MODEL AIRPLANE NEWS

A dramatic black and white illustration of a Bristol Beaufighter in the foreground, angled upwards, with another aircraft exploding in the background. The Beaufighter is shown from a low angle, emphasizing its speed and power. The background aircraft is exploding, with bright light and smoke radiating from the impact point. The overall scene is set against a dark, cloudy sky.

13th Year of Publication

NOVEMBER 1941

Bristol Beaufighter

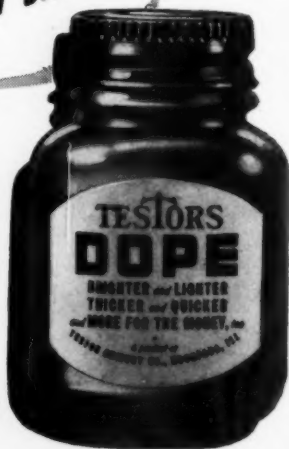
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ON THE BEAM

DURING THE past year we have heard much about mass training of pilots, about mass job training of airplane construction workers—but strange to say nothing has been heard about mass training of skilled engine or plane mechanics and technical men. Without the latter, mass plane production is useless and idleness will be enforced on a great number of trained pilots for lack of proper aircraft maintenance.

YET THERE ARE some fifty schools in the U.S., operating for years under closest supervision of the C.A.A., that have been the principal source for truly skilled mechanics and without which the aviation expansion program today would have been impossible.

THESE PRIVATELY operated schools have had to train their own staffs, design and build special instruction equipment, invest many millions in buildings, laboratories, shops and machinery. Much of this equipment is priceless today because it cannot be replaced.

YET, FANTASTIC AS it may appear, most of this material capable of training 25,000 students annually stands practically idle today. Why?

BECAUSE GOVERNMENT propaganda agencies have spread the information that aircraft and engine training is provided free in the public schools. These publicity agencies, seeming bent on using the terrific power of government to crush private enterprise, do not state however what these free courses lack to turn out a skilled airplane or engine mechanic.

THEY LACK specially trained instrument specialists, armament engineers and mechanics, junior engineers and draftsmen as well as adequate equipment to qualify a student for anything but one or two specific jobs.

IF OUR SHIPS are to be serviced by semi-skilled men the cost in precious lives and expensive ships will be enormous. Yet this disgraceful condition can easily be avoided. Patriotic business men and their technical staffs, who unostentatiously helped to build our aircraft industry from its difficult, unprofitable infancy, stand prepared, efficient, ready and eager to serve their country. Who—or what—stands in the way?

13TH YEAR OF PUBLICATION

MODEL AIRPLANE NEWS

NOVEMBER, 1941

VOL. XXV, No. 5

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Edited by
Charles Hampson Grant

Published monthly by Jay Publishing Corp., Mt. Morris, Illinois. Editorial and advertising offices: 551 Fifth Ave., New York, N.Y. George C. Johnson, President; Jay P. Cleveland, Advertising Manager. Entered as second class matter Dec. 6, 1934 at the post office at Mt. Morris, Ill., under the act of March 3, 1879. Additional entry at New York, N.Y. Price 20c per copy. Subscriptions \$1 per year in the United States and possessions; also Canada, Cuba, Mexico, Panama and South America. All other countries \$2.50 per year. Copyright 1941 by Jay Publishing Corp.

Model Airplane News - November 1941

DON'T KID YOURSELF WITH SHORT "JOB" COURSES!



Aviation has JOBS for thousands, but CAREERS only for trained men!

LIKE thousands of others, you may be able to get into the back door of aviation with inadequate preparation, due to the great temporary demand for manpower — BUT without thorough training you will not be any closer to an aviation career than if you had remained outside. The leaders of aviation who have made it THEIR career are not going to entrust responsible supervisory positions to any but thoroughly trained men. They KNOW what training is required and they know that Curtiss-Wright Technical Institute graduates are—and for many years have been—thoroughly qualified to fulfill the industry's most exacting requirements. You can't fool them and you had better not fool yourself, for your choice determines the course of your entire life.

Located in the very center and a very important part of Southern California's great aircraft industry, with its more than a billion dollars in unfilled orders, Curtiss-Wright Tec has come to be recognized as the nation's leading institution for the training of Aeronautical Engineers and Master Mechanics. Mr. Donald Douglas, President of the great Douglas Aircraft Company, chose this school for his own son's training, which pointedly indicates the high standing Curtiss-Wright Tec has attained in the aircraft industry since its establishment in 1929.

It is imperative that before you invest in a course of career training you determine what the returns will be on your investment...

...for your choice of a school in which to take your training will determine how much money you will make all the rest of your life.

Curtiss-Wright Tec's career training is carefully designed to do just one thing: — TO MAKE MONEY FOR YOU, so upon graduation you can be independent and self-supporting for life. Our thousands of successful graduates have proven that Curtiss-Wright Tec training gets results and always pays, since it trained them in advance for the highest position they could ever expect to occupy. It can do the same for you.

This school has never guaranteed positions for its graduates, but practically every graduate has obtained immediate employment and is advancing rapidly. The demand for our graduates far exceeds the supply, and we honestly believe that every student who enrolls here will be able to obtain, with our assistance, immediate employment upon graduation.

WARNING! — "Don't miss the boat." The greatest opportunity in your lifetime exists today! There never was such an opportunity in aviation for you; there may never be another. A position awaits you. Insure for yourself a steady income and independence for life. **DON'T FOLLOW — LEAD!** Send in your enrollment before you "miss the boat."

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A GIANT SOLID MODEL OF THE BIGGEST SHIP OF THEM ALL DESIGNED BY MODEL-CRAFT. ACCURACY AND REALISM IN ALL DETAILS. ORDER FROM YOUR DEALER—OR DIRECT.

Only a relatively few people have yet seen the B-19, world's biggest airplane, which made its historic test flight almost directly over the Modelcraft factory. A dramatic sight, this enormous bomber-transport has a wing span of 210 feet and a tail that is 3 stories high itself. Its cruising speed is 225 m.p.h. and its range 12,000 miles—half around the earth.

We succeeded in getting one of the men who actually worked on the ship to draw the complete plans for a solid

scale model. The parts are made to actual scale—1/11" to one foot. When you see the model with its four propellers, complete authentic colors and details, you are going to wonder how so much accurate detail can be gotten into a model airplane. Wing span is 19". Price only \$1.00, a sensational buy. Look for B-19's in the red, white, and blue display boxes at your dealer's, or order direct from Modelcraft.

50c — NEW SOLID SCALE FIGHTERS — 50c

ADD 10c POSTAGE



Lockheed P-38

Still the world's fastest interceptor pursuit plane. Model is 1/4 scale. All parts die-cast, with pre-cut fuselage. This is a faithful and exact reproduction of the original ship and makes a very fine model. "P-38" has received a great deal of publicity due to its unusual double tail design and tremendous speed.

ADD 10c POSTAGE



Douglas DB-7

This is one of the new American-built ships being used by the British as night fighters. So far as we know, Modelcraft is the only supply house offering this model to date. Every solid model collector will want it, as well as those who are looking for something different to show in war models. Plans complete and clear.

Lay in a Supply of D-G Propellers Correctly Specified for your Make and Age of Motor



World's fastest climbing propellers, D-G props provide new high thrust with new low pitch. Prices are going UP—so lay in a stock now. See Modelcraft Prop Specification Chart at your dealer's—or give make and year of motor when ordering. Limited time only at this price

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MAKING A NAME
FOR ITSELF—
AND ITS OWNERS

★ ★ ★ ★ ★

SLOTTED WINGS!
TRUE AIRPLANE LINES
CONTEST PERFORMANCE



It looks as if the day of the "aviation-type" contest ship is really here. Modelcraft engineers are proud to have had a part in bringing this about.

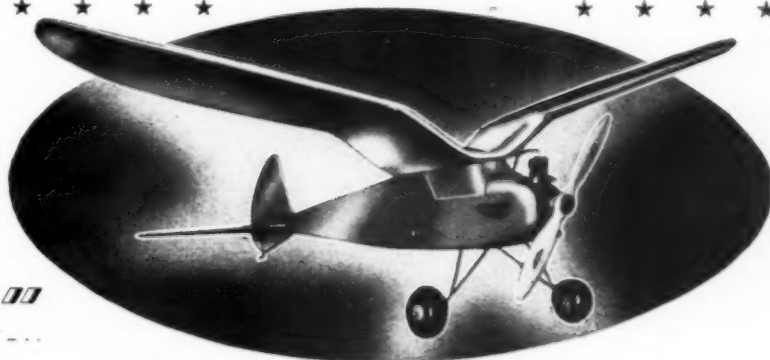
Light yet rugged and perfectly balanced, the *Westwind* knives through the air in a terrific vertical climb. Then as she comes to the end of the engine run, she seems to give a kind of extra thrust on up—here's where the slots show their advantage—before she levels out for a graceful sky-roving glide. Stalls

are a thing of the past. The ship also refuses to loop—at least in any flights to date.

All reports from modelers and dealers indicate that the "*Westwind's* got it"—the performance it takes to make a champion, plus trim projectile-type airplane lines. Order from your dealer now or write direct to Modelcraft. Specifications: Span 54"—for any Class B or small Class C engine. Cord 9", Length 39"; Wt. 8 Oz. per sq. ft. ready to fly. **\$3.85**

★ ★ ★ ★ ★

CLIMBS LIKE A BULLET
GLIDES LIKE A GHOST
THE UNSURPASSED
GULL-WING



"SPOOK"

Spook 48 for Class A or B now has a NEW wing section, still further accelerating its climb. Present owners should write for details to make the change-over. The Spooks have earned themselves a reputation for *airability* under all types of weather conditions. Both are sensationally fast climbers. Model is easy to construct from fully complete kit and plans. Plans only, 25c.

\$1.95

Spook 72—Class C. You are in good company with a Spook 72 as the U. S. Navy has recently adopted the gull-wing Martin Patrol Bomber, PB-26. Thus the gull wing is no longer an experiment as it was when Modelcraft designers pioneered this new-type gas model a year ago. Spook 72 has a long list of Class C firsts to its credit. Complete de luxe kit. Plans only, 50c.

\$3.95

EVERYBODY'S FAVORITE MISS TINY



Here she is once more—sweet as ever and just as sure to fly her way into a model builder's heart. For cocky, dependable, whirlwind performance, there is yet to be a better model than Tiny. Every owner has been crazy about her. Standard kit... **\$2.95**

RUBBER POWERED CHAMPION SUPER SNOOPER

Requires minimum adjustment. Contains latest features: Polydedral wing, dihedral stabilizers, one-bladed folding prop to reduce wind resistance, 45 ft. finest long wearing rubber. Wing area 205 sq. in... **\$2.00**





HOW GOOD IS RUSSIA'S

??

THERE is nothing really miraculous, inexplicable, or even unexpected in the stubborn resistance offered by the Russian Red Army. Though, perhaps to Hitler and

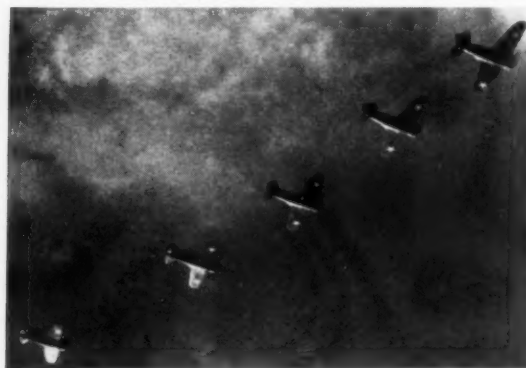
the German High Command, the latter is surprising. In fact, the outcome of this knock-down drag-out fight will leave the Nazi wondering for a long time just what hit them so hard and so often—and from all sides.

The Red Air Force has shown itself to be a potent arm in this conflict despite the scant and misleading information in certain reactionary papers which have pictured the Red Army and its air force as some dark, mysterious enigma, of

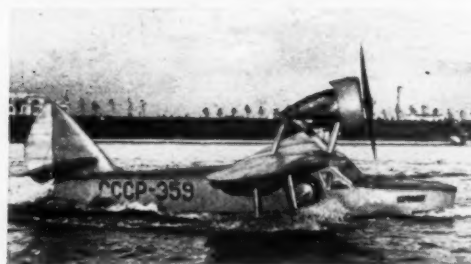
doubtful ability. How changed are their editorials these days! "You can quote me, boys," said President Roosevelt recently, to newspapermen, "the resistance of the Red Army is magnificent." And F. D. R. ought to know; via the channels of the State Department, he's getting accurate, "round by round" reports. And it looks like the U. S. has placed a big bet on Stalin's chances to give Adolph the knock-out blow.

So far the secret of the Soviet Army's successes has been due to the fact that she has kept in utmost secrecy the number of men in the field, the strength of her infantry and artillery equipment, and last but not least, the strength of her air force.

"We must not be taken by surprise—we must keep our powder dry and not be sparing of the means of production assigned to the output of airplanes, tanks, armaments,



A flight of snub-nose Avia pursuits ("Moscas") closely resemble a fighting version of the Gee Bee racer. (Sovfoto)



Russia's highly maneuverable "Mosca" pursuit: A fighting version of the Gee Bee racer

(Extreme left) E-59 Coast reconnaissance amphibian serving as trainer for large flying boats. (Sovfoto)



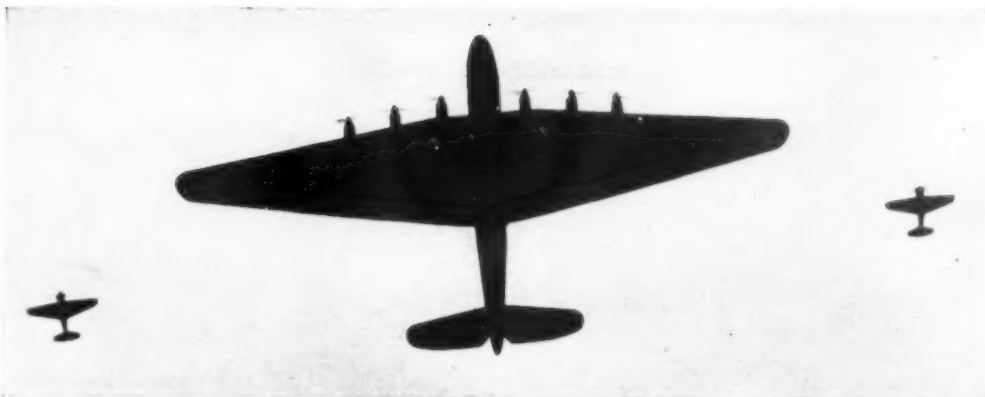
Consolidated PB-Y Manufactured in Russia under license. (Sovfoto)



A YT-I training plane ready for a flight

(Left) There is nothing obsolete about these high speed bombers, shown in a radio photo from the front, dropping their deadly missiles on the enemy. Note their ultra modern design. This is one of the first photos of Russia's secret planes. (Sovfoto)

A huge six motor bomber, the L-760, accompanied by two protecting pursuit planes. One of the largest bombers in the world (Sovfoto)



AIRFORCE

How Russia Has Developed Its Airforce in Secret and Planes Now Being Used in Combat

By JESSE DAVIDSON

naval vessels, and munitions," said the spokesman for the Soviet State Planning Commission. Stalin supplemented this by saying, "Any pig that sticks its nose in the Russian garden will get its nose clouted good and hard."

The precautions taken by the Soviet Union against an eventual attack from her enemies (and she knew who each and every one was) necessitated following a series of programs which built her to be admittedly powerful both militarily and economically. While typewriter and radio generals took great pains to deny this fact, testimony was offered by many military observers such as Nazi experts Gen. von Bulow, Ganderberg von Moisy, and Captain Liddell Hart, foremost British military analyst, as well as others whose knowledge of the Soviet military might are based upon irrefutable facts and not hearsay. Even our own Intelligence Department knows more than it is willing to admit.

Our main concern on the issue—How strong is Russia's Air Force—is: 1—

What are they fighting with; 2—How do their machines compare in quality and quantity against her aggressors; 3—How good are her airmen?

To begin with, the actual strength of the Red Air Force is vital information that both her allies and enemy would like to have; naturally, no country is so naive that it offers such information. Up to the first week of August, the Germans claim they downed 10,000 Red planes. Remember this figure. In spite of such a report or reports to come, the Russians, to everyone's amazement, are still coping with the best that Hitler can build, or throw in.

The strictest censorship is imposed in the USSR concerning the numbers of fighting aircraft; she discourages curiosity along these lines. Photographs or

(Continued on page 60)



Loading one of Russia's modern streamlined bombers equipped with skis for winter operation. (Sovfoto)



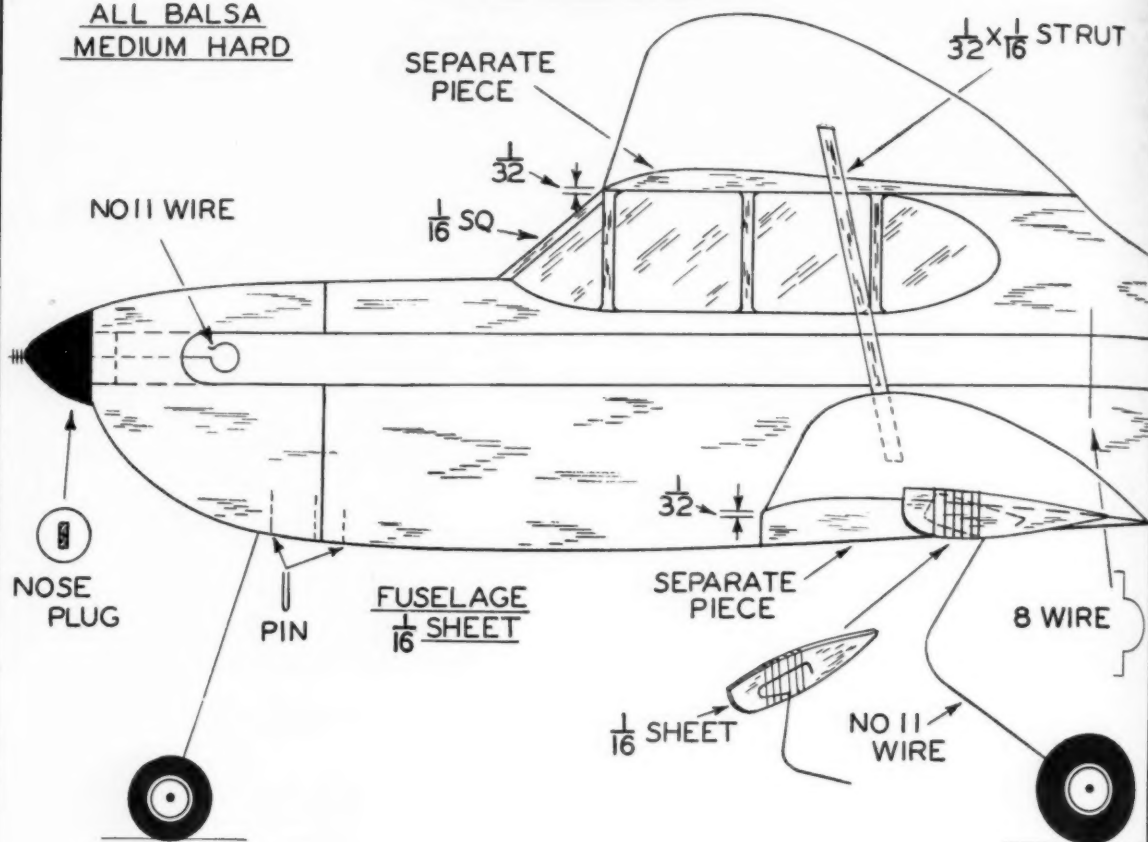
The famous "Chato", highly maneuverable fighter that whipped the German planes in the Spanish revolution. They had a top speed of 245 m.p.h. (Sovfoto)



A Soviet A.N.T. tandem powered reconnaissance flying boat, used for coast patrol. Note the nose turret. (Sovfoto)

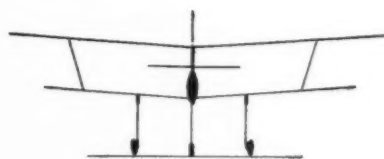
PROFILE CONSTRUCTION

ALL BALSA
MEDIUM HARD

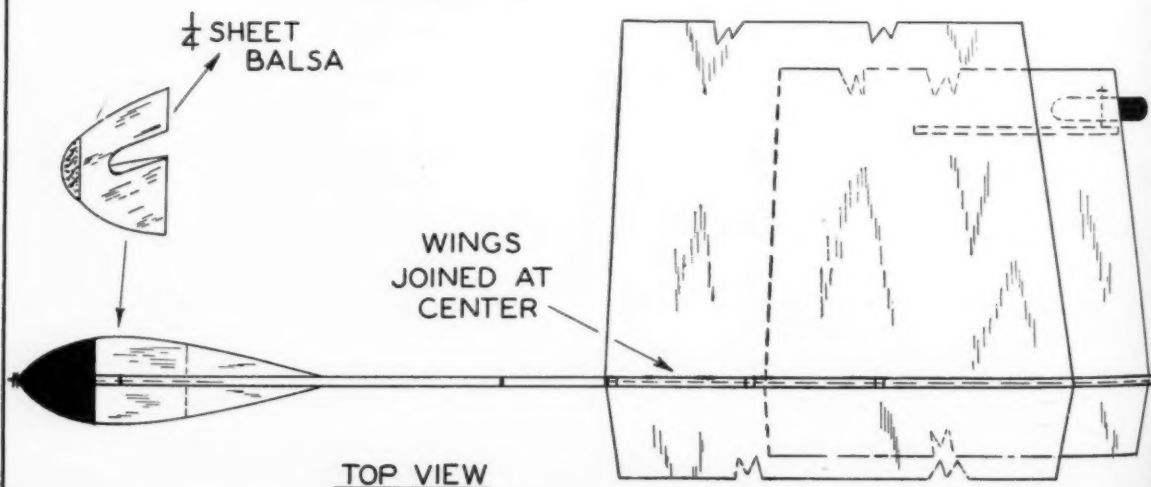


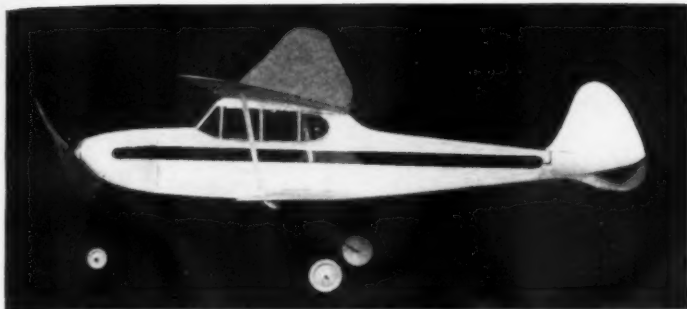
HARD
WOOD WHEELS

FRONT VIEW

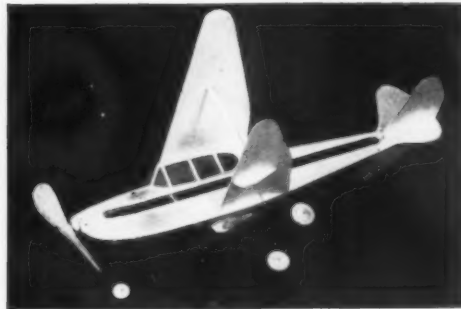


TOP VIEW





With both looks and performance it can be completed in a few minutes



Yes, a biplane, with three wheels, too

A Profile Three Wheeler

By REX HALL

A Simple Sportplane of Unique Design and Performance
For Novice or Expert



Here it is in steady climbing flight

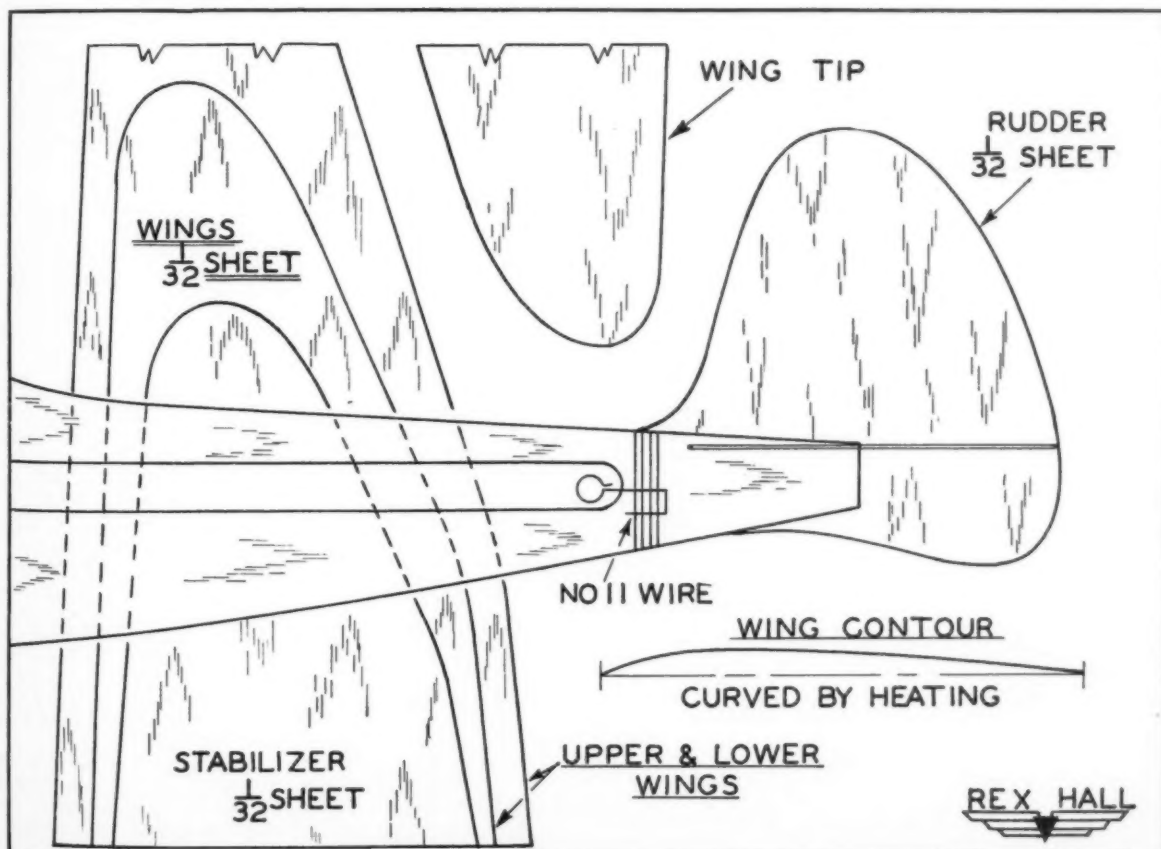
UNLIKE most models, the "profile" offers beginners a chance to build something simple and yet a model that is new. Its simple construction saves long hours of work; its tricycle landing gear gives it a very modern appearance and aids flying ability, due to lowering of the center of gravity. Some beginners may think it is too complicated because of this landing gear, but it's as simple as the ordinary type.

One may expect excellent flying qualities

in the simplicity of its construction and sound aeronautical design. The high wings and landing gear aid in lowering the center of gravity, also the body, shaped in this manner, offers little head resistance. All these features put into one plane gives it very exceptional flying ability.

This little ship consistently turns in top-notch R.O.G. flights with few winds and the many successful flights it has made would encourage any model fan to take

(Continued on page 36)





Bruno Marchi: Now he's in the Army



Jesse Bieberman: An active leader



John Dilly: In Canadian defense work

Who's Who In Model Aviation

Bruno Marchi

BRUNO MARCHI started off in Boston, Mass., in 1915 without a "stitch to his name" and after a normal babyhood evidenced much interest in aviation. Through model building Marchi started streamlining his career as well as his family name which is Pieromarchi—and very euphonious, too. As just plain Bruno Marchi he went through Wentworth Institute, New England Aviation School and Boston University, emerging with a B.S. in aeronautical engineering and quite a reputation as a model aeronaut.

Through participating in almost all the regional meets east of the Mississippi and practically every Nationals, Bruno has amassed almost 50 trophies, cups and plaques and a drawer full of medals.

As a Jordan Marsh-Boston Traveler Junior Aviation League "Ace" Marchi got around the country on a magnificent scale as a member of the J.A.L. Flying Squadron which would fly indoor, outdoor and/or gas models in competition with anybody at the drop of a stop-watch. In his spare moments Marchi collaborated in the design and construction of the Boston Low-Speed Wind Tunnel, the largest ever constructed for testing model airplanes and not models of full-scale airplanes. So much data was collected from these tests, Marchi, in conjunction with other J.A.L.'ers, issued reports in the form of the "Journal of International Aeromodeling"—a noble effort which demonstrated that unsponsored scientists eat infrequently.

Bruno's first prize, won in a Community Service of Boston contest, was a pocket knife which he used in carving some of his best propellers including those which put him into the exclusive "more-than-21-minutes-indoors" club and gave him a second place in the gas events at the St. Louis Nationals in 1935. His gas model, embodying all his design theories, looked like a frightened duck, but flew across the Mississippi like a graceful seagull trying to

(Continued on page 32)

Jesse Bieberman

JESSE BIEBERMAN, sponsor of the Philadelphia Gas Model Association, became interested in model aviation more than 10 years ago through an aeromodeling group he formed in the Philadelphia Junior High School where he teaches mathematics.

Before teaching, Jesse, who was born and has always lived in the Quaker City, did graduate work in physics and math at the University of Pennsylvania. Mr. B.'s P.G.M.A. has as members many outstanding modelers including Pete Andrews, Mayhew Webster, Erv Leshner, Dave Call and others who gravitated to the association from the old "Northeast" club.

It has long been Bieberman's desire to see all gas model groups in Philadelphia banded together and as we go to press plans are shaping up nicely for a city-wide gas modeling council. Phil Zecchitella, Bill Berry, Jr., and others are working toward a consolidation of leaders to coordinate meets and activity and to be recognized by the A.M.A.

But back to Jesse who has attended about all the recent National meets except one when he had to stay home and pass around cigars on account of a Miss Bieberman (now 3 years old) who may also take up model airplanes some day. (In the meantime, we are informed, she is very good at taking some of Jesse's models apart!) In 1937 Bieberman was a witness at the Wakefield meet held in England.

Jesse depreciates his competitive record, but his fellow fliers point out he has done well for himself in gas and indoor events and has some very nice "hardware" at home. His interest of late has turned to radio controlled models and his participation in that category at National meets is a regular affair. Back in 1939 Bieberman expressed the wish that N.A.A. would take more interest in model work and felt that if it did model aviation would have a great future in America. His predictions have

(Continued on page 32)

John T. Dilly

BESIDES being the most famous hitchhiker in the annals of aeromodeling, John T(humb) Dilly has been dubbed the Dean of Canadian model aviation.

John became aware of the balsa and bamboo hobby in 1926 during a visit to Washington, D.C. Upon his return to Canada he organized his first modelplane society in the Dominion, the Georgetown Model Club, and since Dilly was the only member who had ever built a model he was unanimously elected president!

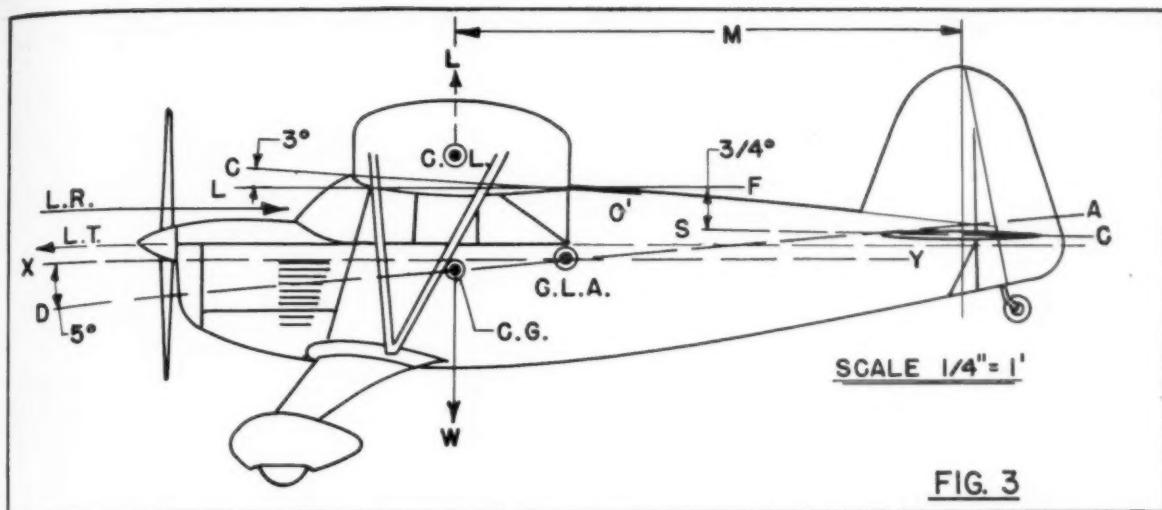
Moving to Galt, John affiliated himself with the local Y.M.C.A. and blossomed out as a "miniature aircraft instructor." Out of the "Y" group grew the Galt Model Aircrafters, which on a number-of-records-per-member basis continues to be one of Canada's outstanding clubs.

In 1928 John signed up with the General Airplanes Corp. in Buffalo to help build super-planes of the pre-depression style. From Buffalo Dilly returned to Ontario to lend a hand in a family-owned machine shop. Before the present hostilities broke out, he was in charge of the automatic division of the Butler Machinery Co. in Preston. Having taught himself machine shop technique from A to Z, John was a sort of junior vice-president in charge of stamping out metal automobile parts.

J.T.D.'s contest flying dates back to the 1928 American Nationals held in Detroit under N.A.A. sanction and sponsored by the American Boy magazine. Since then his annual trek to the U.S. Championship meet has become a matter of habit. In 1936 John jaunted down to the Lakehurst, N.J., airdock to the Eastern States indoor contest and the following year won the title "Canadian Adult Champion" for the first time.

At one time Dilly was a member of the Kitchener-Waterloo Flying Club and had quite a few solo hours to his credit. He has had considerable "time" in gliders and

(Continued on page 36)



MODEL DESIGNING SIMPLIFIED

IN THE preceding article the most efficient method of designing a stable contest gas model was described. This consisted briefly of establishing a force layout that creates stable reactions on the plane during flight and then constructing the outline of the model to conform to it. In such a procedure the outline form is subject to the requirements of the force arrangement.

However there are instances in which the model designer desires that his plane conform to a definite predetermined structural form: he may wish it to be a miniature of some full scale craft or to assume some shape pleasing to his individual conceptions of design. In such cases another method must be used: one in which the force layout or arrangement is established by the outlines of the plane.

Under these conditions the side view plan of the plane is first drawn, and the forces arranged in such a manner that they conform as closely as possible to the most stable arrangement, established by the first method.

Fairly stable setups can be created for nearly all types of planes by slight modifications. Of course some of the factors such as the C.L.A. are fixed by the plane's design, but others like the C. G. may be located as required to create the stable force setup. In the second method, this is the basis of procedure.

The first step in design of a scale or semi-scale model is to select the particular type you wish to build. Let us assume that it is a model of the Rearwin Speedster.

The second step is to determine its size or wing span. To reduce the possibility of damage when landing a medium size or comparatively small span should be chosen. The span of the full scale plane is 35 ft. 2 in. If the model is made to a scale of 1.15 in. equals 1 ft., the model span will be 52.8 in., a fairly short span and one suitable for a Class B 0.23 cu. in. or a 0.19 cu. in. displacement engine.

Copyright 1941, by Charles Hampson Grant,
Model Airplane News - November 1941

An Easy Way to Stabilize a Scale Model or One of Any Desired Design

By CHARLES HAMPSON GRANT

Article 12

The span and scale of the model being known the side view can be drawn; the third step. First determine the distance from the center of the wing to the stabilizer center and mark off this on the thrust line, drawn horizontally; in the Rearwin Speedster this distance, M is 12-1/4 ft. Then lay out the rest of the side view proportions on a piece of light cardboard and draw in all structural features as shown in fig. 3.

Certain design modifications will have to be made for efficient and stable flight. First change the dihedral so each wing tip is raised 5/8" per ft. of span. The span is approximately 4.4 ft. Therefore each tip of the model should be raised $4.4 \times 5/8 = 2-2/8 = 2-3/4$ inches. In the side view drawing, show the wing with the tips raised the correct amount. Fig. 3 is to a scale of $1/4" = 1"$ and shows the wing tips raised $15/32"$ from the chord line.

Second, the landing gear length should be changed to allow ample propeller clearance for possible "nose over" landings: this reduces propeller breakage. The chance of breakage is reduced still more if the wheels are also moved slightly forward. The fig. shows an increase from scale dimensions of $3/8"$ in length as well as forward displacement.

When the side view outline has been completed, determine the center of lateral area position; the fourth step. To do this first cut out extra pieces of the cardboard to the exact outline of the wing and landing gear side elevations, the latter including struts and wheels. Paste these over

their respective parts on the cut—outside view, and balance the pattern on the point of a pin. When it remains in horizontal balance, press the pin point through the cardboard, thereby indicating the C.L.A. position. This will be located approximately as shown in fig. 3.

Next, the fifth step, locate the center of lift, C.L., half way between the wing leading and trailing edges and 40% of the wing tip rise above the center section chord line C-C'. Mark this on the side view.

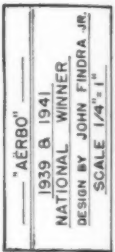
The sixth is to draw a line at -3° to the chord line through the wing trailing edge. This is the normal line of level flight. Then seventh, draw the stabilizer chord line S-C, $3/4^\circ$ positive to L-F. This provides a difference in incidence angle between wing and stabilizer of $2-1/4^\circ$.

Now, eighth, draw in thrust line through the center of the propeller hub parallel to flight line L-F. This establishes the correct settings of the surfaces relative to the line of thrust L.T. and assures good balance during level flight and climb.

The ninth and most important step is to establish the most favorable center of gravity position, C.G. This is not fixed definitely by structural characteristics of the plane. The problem is to place it so the best stability and efficiency characteristics result, its location being determined by aerodynamic considerations only.

This is possible in a gas model but not in a rubber powered craft. In the former there are movable weights that may be disposed within the plane so C.G. is located at the desired point. These weights include batteries, coil and timer. Because their weight is a large proportion of plane weight, a slight displacement causes considerable change in C.G. location. This is not the case in rubber models because all weights are fixed by basic structural demands.

Therefore the desired location of C.G. is
(Continued on page 68)





Structure is simple with no excess weight



The 1941 high time national Class A winner

NATIONALS HIGH TIME CLASS A WINNER

This Plane Made the Longest Class A Flights at the 1941 National Contest and Is One of the Most Consistent Fliers Ever Built

By JOHN L. FINDRA

THE Aërbo, through its envious stage of winnings, has proved to be the most deliberate thermal hopper ever to travel the Blue Sky Line. The ship, like its namesake the Hobo, never stays in one place long. It may be with you for a few contests, but suddenly, a change of mind, and the ship catches the next thermal train for the cumulus-clouded azure blue. In order to tame the Aërbo and to overcome the inconvenience of long thermal flights, a short motor run should be used; then the rugged little "thermal thief" will provide many pleasant hours of sport flying.

The ship is a bombshell of pep. As soon as she leaves the ground her nose is up and she begins a tight corkscrew climb; after twenty seconds she reaches the amazing altitude of 300 ft., levels off and begins her thermal picking.

The ship has amazing thermal tendencies. To supply these tendencies a long moment arm and a small rudder area was used. This arrangement created a rocker motion to enable the ship to play along with the thermals. The result: wherever the thermal goes there goes the Aërbo.

The Aërbo, not being an overnight discovery, but a three year project, has more than repaid its designer for effort and patience invested. The first



Efficient design gives little head resistance



Findra making a test flight; note the steep climb

ship, built in 1939, was a "Wedgy" type and created a great deal of frontal resistance. To overcome this disadvantage the present design was originated. Two models of this design were built, proving very successful, for they flew "right off the drawing board." Number one took third at Broomall, Pa. without a test flight and placed no lower than third in every contest thereon. With the Nationals near and the original ship ready for retirement, we built a second ship, improving some weak spots observed during the original's progress. The second ship was built in the two days preceding the 1941 Nationals and was test flown at 59th and Keller Ave. the very day of the contest. After a few minor adjustments it was entered in official competition and piled up a total time of eleven minutes, five seconds.

Prototypes have been built by many local modelers, all proving to be very consistent. If adjustments mentioned further in this article are used, and plans exactly followed, no trouble will develop when flying the plane.

The ship which won at the Nationals flew with the tail at zero incidence, the wing three degrees positive; the motor and tail adjustments were fixed after the ship was thoroughly

(Continued on page 38)

SCALE - FULL SIZE

TYPICAL RUDDER RIB

5

2 REQ.

4

2 REQ.

3

2 REQ.

1-2

2 REQ.

STABILIZER RIBS

ALL RIBS 1/16" SH.

5

2 REQ.

4

2 REQ.

3

2 REQ.

CUT OUT ON DIHEDRAL
RIBS ONLY

1-2

7 REQ.

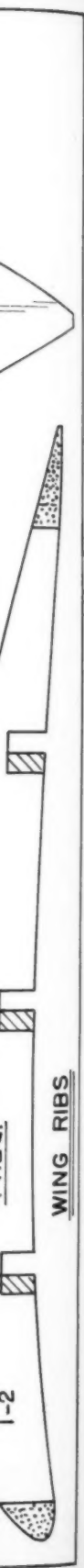
WING RIBS

R 2 1/8" SH.

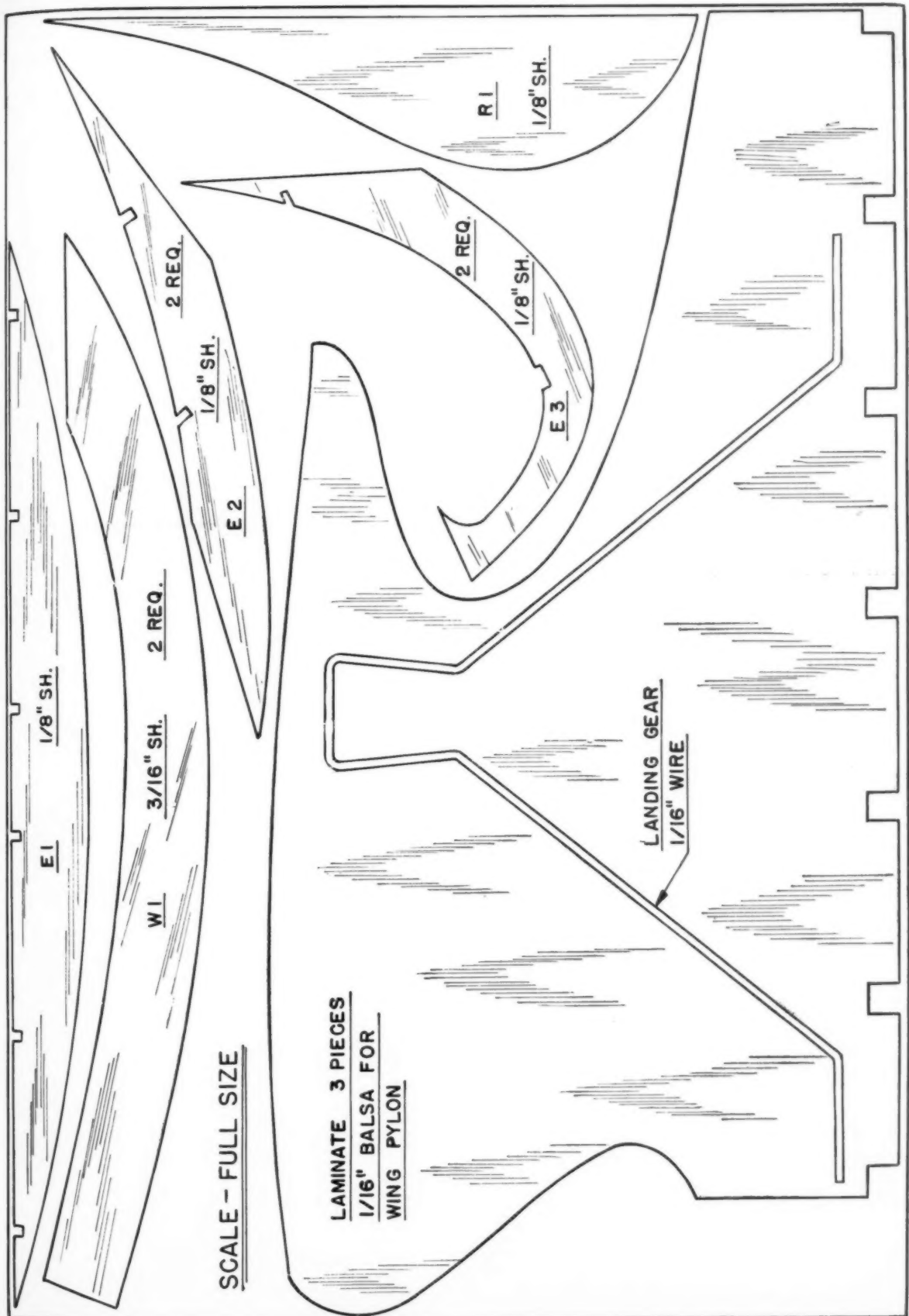
W 2

1/4" SH. 2 REQ.

FIRE WALL
1/16" PLYWOOD

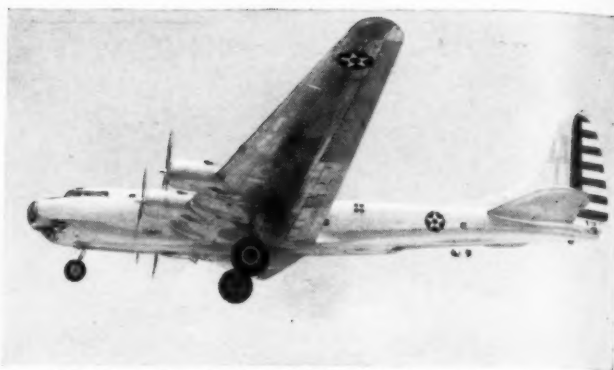


WING RIBS





400 m.p.h. P-40D has more fire power than P-40



The 82 ton Douglas B-19 bomber on its first flight (Acme)



350 m.p.h. Douglas attack bombers; fastest and heaviest armed big planes ever made (Acme)

FRONTIERS

Highlights of the Latest Developments in Aviation

By **ROBERT C. MORRISON**

and while we wait for the parts makers so the ships can get rolling, we can go ahead with our training program and get fliers trained. In the meantime new designs

may be whipped into shape and tested. Vega test flew its new Ventura bomber for Great Britain and the letter "V" for Vega, Ventura and Victory was never knocked around so much before by the press. The airplane flew o.k. in spite of everything, however. In the meantime, over on the other side of Los Angeles, Vultee was busy at work on a "V" campaign with its new Vengeance for Great Britain taking most of the punishment. Vultee of course had more to work on with its Vanguard, Valiant and others. They probably got their vice-president up early that day; someone said the British are going to buy the B-19 and name it Vulnerable.

But getting back to the Ventura, we see in it a well designed airplane; it has a com-

pact, sturdy appearance with good proportions. Much like the Lockheed Hudsons, the Vega ship is larger and has cleaner lines, contributed mainly by use of the small frontal area Pratt & Whitney Twin Row engines. The two engines are tightly cowled with conventional NACA cowlings with carburetor air intake scoop above, an integral part of the structure. Cooling flaps surround the trailing cowlings edge. A fairing covers the single exhaust manifold tail pipes which is probably designed to eliminate as much exhaust glare as possible when night flying over enemy territory.

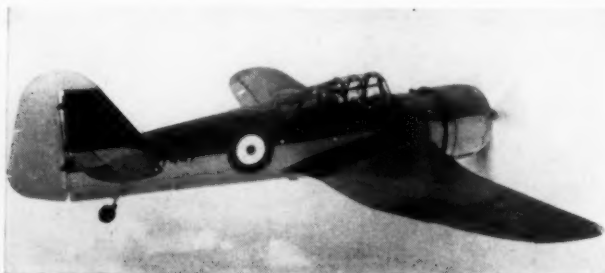
(Continued on page 42)

A FEW more flying "spark plugs" for Great Britain have taken the air recently, which means the Germans will have to get busy on a new set of aircraft recognition charts. We believe the new airplanes will cause the Germans more labor, however, than that of just making new charts. The sound and fury of these new ships should not be very pleasing to German ears, and the great variety of them will make it difficult for the Germans to ascertain just what they are shooting at . . . even if they have all their charts.

One thing apparent is that the American aircraft engineers have not been idling their time away, and they might just as well be testing and designing improved aircraft as, at the moment of this writing, aircraft production lines are about the slowest moving things going on in this country; aircraft manufacturers are waiting for the parts and accessory makers to catch up so they can go ahead with production. Material shortages are also becoming a reality, and the mere trickle of airplanes coming off production lines would never win a war. However, the trainer production is "up to snuff,"



The 375 m.p.h. Martin B-26 bomber is armed with approximately twelve 50 caliber machine guns



Miles Master II, Britain's latest trainer, flies 250 m.p.h. (Fox)



Curtis interceptors ready for action in Java

Academy of Model Aeronautics

A Division of the National Aeronautic Association

OFFICIAL MODEL AIRPLANE NEWS

THE OFFICIAL GOVERNING BODY FOR
MODEL AERONAUTICS IN AMERICA—JOIN NOW!

New A.M.A. Chapters in Nation-wide Network of Model Clubs

INCREASED aviation activity always means an upswing in the number of model aeronautical enthusiasts, and consequently more model aero clubs. Many new chapters have been recognized by the Academy of Model Aeronautics, N.A.A.'s modeling division, with headquarters in the Willard Hotel in Washington, D.C.

Youthful interest and American ingenuity is indicated by the names selected by these clubs. Following are a few of these new A.M.A. chapters: Vineland, N.J., "Aeronauts" whose Andrew Canino is the contact man; "Aero-Gnats" of nearby Woodbury, N.J., whose director is Herb Souder; "Balsa Buzzards" of Lansing, Mich.; "Prop Twisters" of Greensboro, N.C.; "Prop Spinners" from Culpeper, Va.; Frankfort "Hell Cats" of Philadelphia; "Trico Prop Twisters" of Pontiac, Mich.; and the Elm City Gas Bugs of New Haven, Conn.

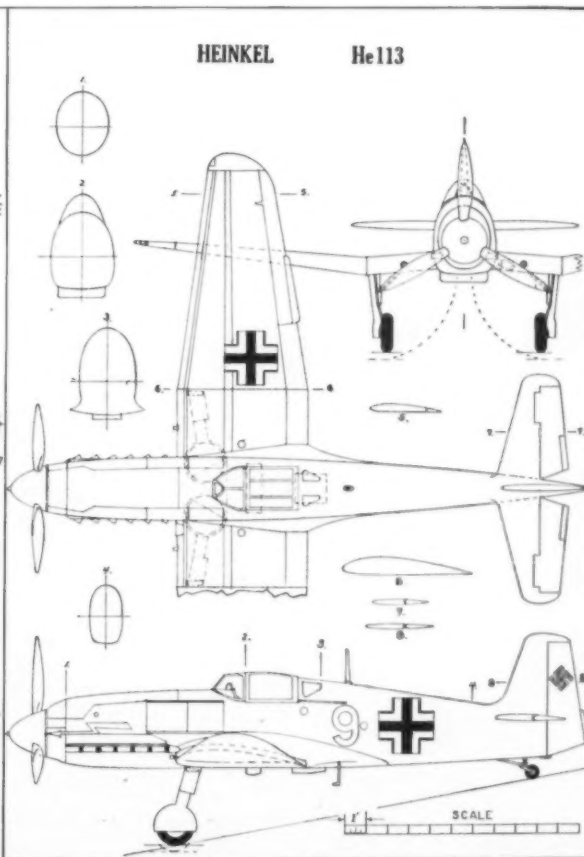
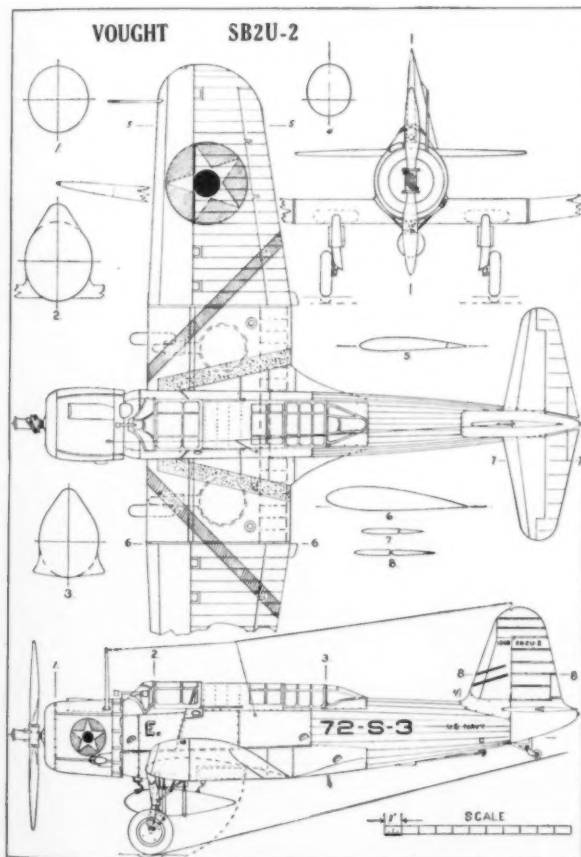
Mona Mae Turner of Cleveland, Ohio,

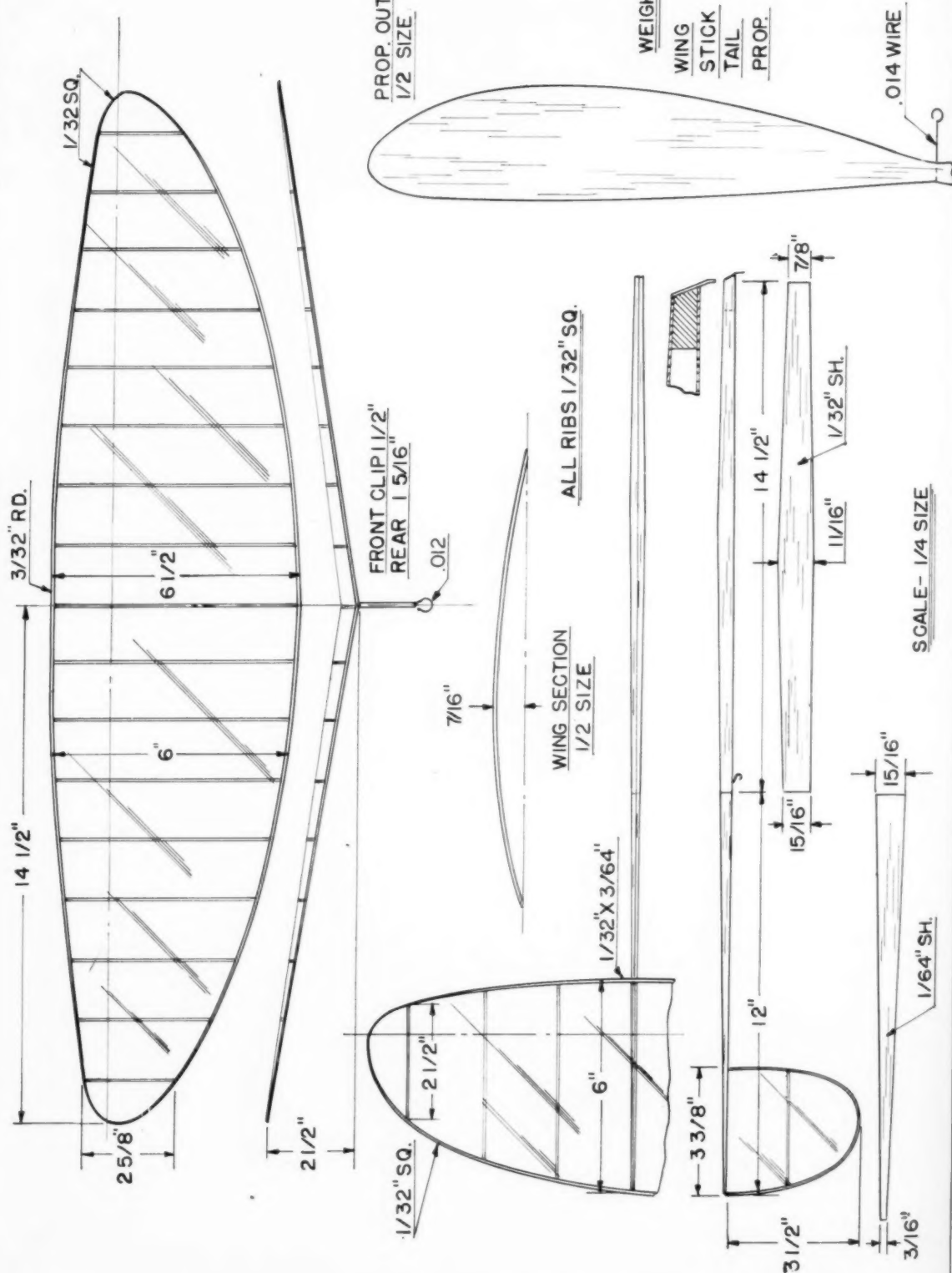
has secured affiliation recognition for her Boystown Model Aviation clubs and other new chapters have been established in New Orleans by R. A. Jumonville; San Francisco, by Ernest W. Davies; Wilson Dam, Alabama, by Leland E. Browne; River Rouge, Mich., by George Molisee; Massillon, Ohio, by George Buss; Chattanooga, Tenn., by Thomas Douglas; and Klamath Falls, Oregon, by Dee Burke.

Academy to Certify Chapters

Taking a leaf from the N.A.A. book, with a profuse bow of thanks to the N.A.A. chapter division, the Academy has put the machinery in motion to "certify" as many of its chapters who make application and show that every one of their members holds a rubber or gas model flier's license in good standing

(Continued on page 36)





THE SPRINGFIELD TROPHY WINNER

The Simply Constructed Winner of the
1940 National Indoor Stick Open Event

By **WALTER MARCH**

THIS trophy winner is the result of a "last minute" decision to enter the indoor events at the '40 Nationals.

Although built the night before the contest, the basic design was conceived by the Illinois Model Aero Club as a whole, five years back. It had been flown at the Nationals each year since 1935, with some small measure of success, but until 1940 never quite got into the winning circles.

Construction was finished about 5:30 A.M. the morning of the event; as a matter of fact, drops of water were still present on the microfilm when it was packed for the trip to the Amphitheatre. Upon test flights we found no adjustments were necessary, except for a little twist in the bearing.

The winning time was not very high; 17 min. 32 sec.; this was partly due to the low ceiling. The model repeated this victory by taking first place at the Mississippi Valley Meet a month later, against all age divisions.

We can truthfully say the builder who undertakes the job, using the best possible workmanship, will be rewarded with a stable, easy to fly and fine-performing ship.

Construction

General Instructions: Before beginning construction, study the drawings and read the entire article carefully.

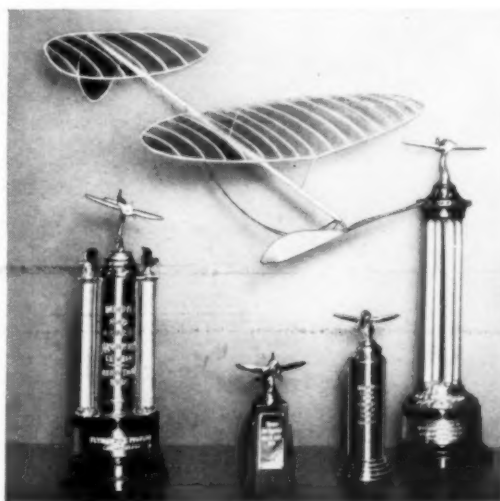
To begin with it is advisable to make a full scale drawing of the wing and tail surfaces, using a pair of dividers or following dimensions on the drawings.

Take your time, be sure every part is perfect before proceeding to the next. Use only the best materials obtainable, for the plane can be no better than the material,

time and care used in constructing.

Wing: The four spars are cut from 3/32" quarter-sawn sheetwood, of about 4.5 lbs./cu. ft. Sand carefully to a round cross section 3/32" in diameter at the center, tapering to 1/32" square at the tips.

Next cut 17 ribs 1/32" square from 1/32" quarter-sawn sheet stock. It is important



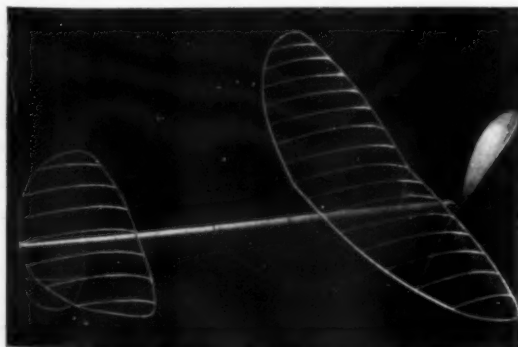
The plane and trophies it has won. (Shereiv)

that the ribs cut be smooth and even; use a metal template as a guide to slice them.

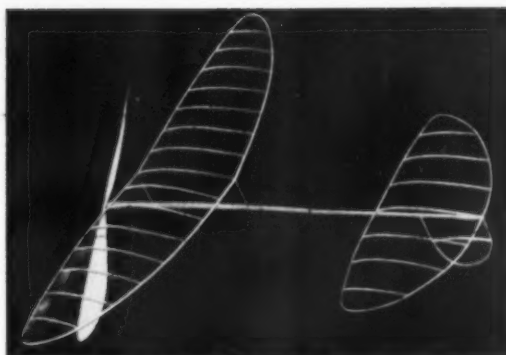
The tips are made of 1/32" sq. and bent about a hot electric soldering iron to correct shape. Moisten the spars and pin to the drawing. Cut the ribs to fit by trimming off the proper amount from the trailing edge, cement in their places evenly.

Then cement the tips to the spars fitting them carefully. Upon drying, remove the wing from the drawing; sand smooth all burrs and glue joints and set aside till time to cover.

Tail: The stabilizer is constructed in very much the same manner as the wing. The four spars are cut from 1/32" quarter-sawn sheetwood 1/32" x 3/64" sq. at the center tapering to 1/32" sq. at the tips. Round off the corner with sandpaper.



Lifting tail and small dihedral give efficiency. (Shereiv)



1940 National stick winner with wood prop

Pin to the drawing and proceed as with the wing. The rudder ribs are cambered, the camber facing to the right on the model. That is, so that the ship will circle to the left or with the torque.

Motorstick: Select a light piece of 1/32" plus quarter-sawn stock for the stick.

Quarter-sawn wood is used for the stick and boom, even though it is more difficult to bend so that a lighter and stronger stick can be obtained. Sand on both sides lightly to remove saw marks till the blank is 1/32" thick. It is then soaked in warm water for a few minutes. Bend around a solid former, using gauze wound around the blank and former. Be careful to make the seam straight. This is important if the stick is to have a maximum rigidity. Bake in a hot oven for about 10 min. to hasten drying.

Remove the former and cement carefully, again checking the seam for trueness. For reinforcement, two pieces of 1/64" sheet 3/4" long are used in the stick ends. The stick is then capped with 1/32" sheet. The rear hook is bent of .014 wire. The thrust bearing is made of a piece of .030 sheet dural and drilled. Finally the wire parts are cemented on the stick.

Boom: The boom is made from a piece of 1/64" quarter-sawn sheet wood using the same procedure as that used in constructing the stick.

Propeller: The propeller is carved from wood of about 4 lbs/ cu. ft. Select a block 16 3/4" x 1 5/8" x 1" of about this weight, making sure there are no hard spots and the block is straight-grained.

Next the quarter-grained lines should be inspected. These should be such that when the block is cut the blades will have quarter-grained wood, for maximum strength, about 1/3" out from the hub. Rough out each blade's concave side, taking utmost care and time to do a perfect job. Work on each blade alternately; that is, do a small portion on one blade first, then repeat on the opposite blade. The concave side should be completely finished before starting the convex side. The propeller is about 3/32" thick at the hub and paper thin at the tips. Finish the sanding with 10-nought sandpaper and rub the prop carefully with the back of the sandpaper to compress the wood fibers and make a fine finish.

(Continued on page 54)

GAS LINES

AIR WAYS NEWS OF MODELS AND BUILDERS FROM ALL PARTS OF THE WORLD

IN RUSSIA and Germany during the last ten years, the governments organized model aviation programs for educating young men in aviation's fundamental principles. This served as a backbone for the development of their armed air forces and production systems.

Ten years after this was inaugurated in these countries, even under the stress of impending war, the United States has not yet organized such a program for its youth. They move onward serenely talking of producing 30,000 airplanes a year, apparently expecting to "grab" skilled workmen, engineers and pilots out of "thin air."

It has been left to patriotic individuals and organizations to carry on this work and educate young America through the medium of model airplanes, which they have done during the last ten years, without any recognition whatsoever from the government. In fact, many government officials at pres-

ent have never even seen a model airplane nor understand how it functions, mechanically or educationally.

Now we have the situation of a \$4,000,000 business, built up by enterprising far-seeing individuals who have staged thousands of contests and educated thousands of young men in aviation principles; many of whom now are participating in our defense program—an educational structure vital to our defense has been created. And now our government has so little concern about this matter that manufacturers of and dealers in airplane materials are threatened with the necessity of shutting down their business because it is impossible to get material required for model planes, engines and necessities—material so insignificant in volume that it would not curtail the manufacture of more than five large airplanes.

Up to the present moment model manufacturers and dealers have been unable to obtain a priority number; they have been designated by the government as an industry not pertaining to defense.

Such a situation causes loss of respect for the knowledge and understanding of men responsible. What must model airplane enthusiasts do to awaken government officials from their intellectual slumbers? At present thousands of young men educated through the use of



1. A gas job takes off at the Denver, Colo. annual contest



2. Denver Meet contestants wait to have planes processed



3. Leonard Wolf and Bob Prajen, winners at Tampa



4. A beautiful scale gas model of a Douglas 046-A, built by G. V. Weeks. More and more builders are turning to flying miniature "big" ships



5. Russian modelers at a contest prepare for air defense



6. Director and winners of Florida State Contest



13. Another Vasquez plane that "dive bombs"



12. Armand Vasquez with his super-stunt plane. It does everything

model planes are able, through this knowledge, to produce our air fleet. Is the supply of this skilled labor to be curtailed by government ignorance? It is evident that everyone interested in our country's welfare must take immediate action.

MODEL AIRPLANE NEWS suggests that every model builder drop a postcard to his Congressman, calling attention to this sad state of affairs and request an immediate investigation and action that will keep model airplanes flying as an instrument of aeronautical education. Perhaps it might be well to invite some of our Congressmen to attend at least one of the many hundreds of flying events taking place during the fall months; this is one way of breeding enthusiasm.

One of the most interesting contests held lately was the fifth annual event held by the Exchange Gas Model Club of Denver, August 3, at the A.M.A. Flying Field. Picture No. 1 shows a plane taking the air during the meet. Many modelers in crowded districts will envy this club for the broad expanses of country available for its operations, as evidenced in the picture.

Picture No. 2 shows a number of the contestants at the weighing-in table. Jim Anderson, winner of first place, may be seen with the white hat in the left center



10. Jim Walker with his Nationals radio winner



11. Bob Sweger, Granite City Meet winner

of the picture, slightly in the background.

This contest is held each year to determine the state gas model airplane champion. The spectators numbered more than three thousand and there were one hundred and thirty-five ships on the field. While all these did not enter into the contest, those that did had one of the finest times of their lives. The weather was ideal and prizes more than attractive: One hundred dollars in cash, divided into ten prizes and more than one hundred dollars in merchandise awards also divided into ten prizes.

A number of interesting features were

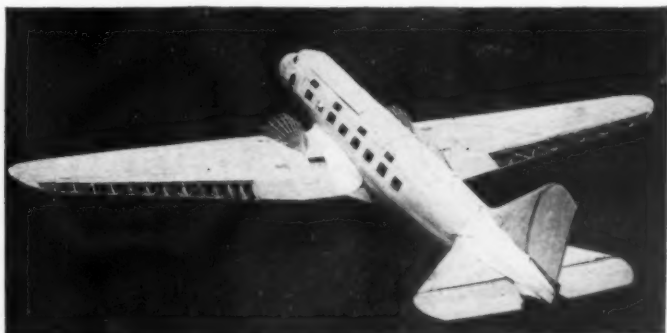


9. Proud winners of the Queens, N. Y. gas contest

introduced for the spectators: A parachute jump, balloon ascension, altitude
(Continued on page 44)

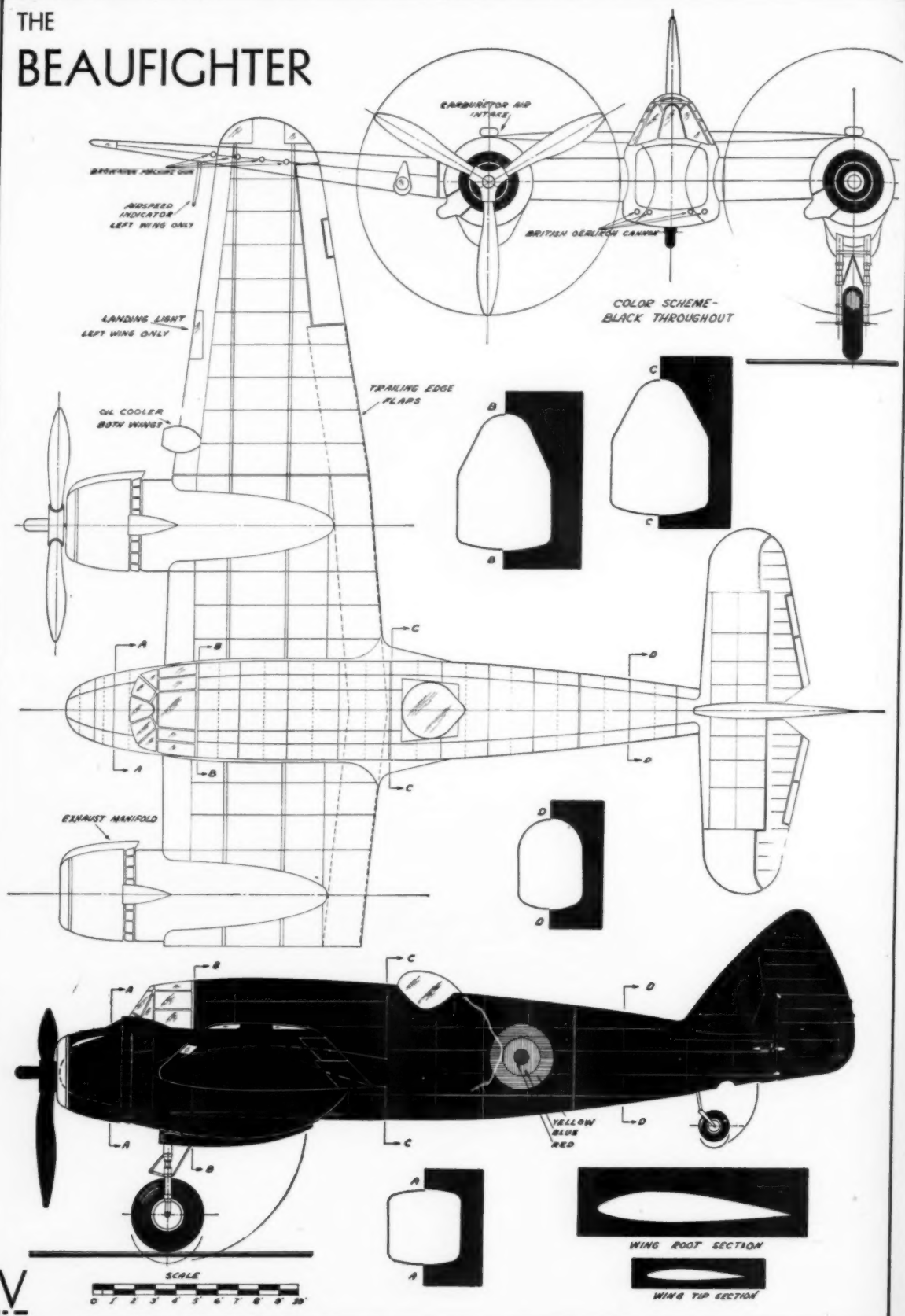


7. Bill Thomas launches his "super-design" at Daytona



8. Chas. Englerth's 9 ft. 10 lb. scale Douglas transport gas model

THE BEAUFIGHTER



BOMBER WATCHDOG

The Plane
On the Cover

By **ROBERT McLARREN**



The Bristol Beaufighter is Britain's new bomber escort fighter

READIN', writin' and 'rithmetic lessons are learned from school books but war lessons must be learned the hard way. The war wasn't six months old when bomber losses became acute. Hundreds of Luftwaffe bombers rained down upon the vast meadows and rugged sea-cliffs of England as World War II progressed. An equal, or perhaps greater, number of R.A.F. bombers came to rest a splintered maze of twisted spars and steel tubing over the soggy, damp fields of the Low Countries as the ravages of war grew more thorough. The four-gun tail and nose turret was developed and perfected for use in defending the giant bombers on their missions of destruction but to little avail. Bomber losses continued to grow until crews formed betting pools against their safe return from Nazi-held territory, those returning dividing the money. The formations were enlarged in the hope of mutual protection cross fires from adjacent gunners, altitudes were increased un-

til accuracy became almost impossible, and dozens of miles were flown in long, slow glides with power near-off in the hope of baffling the enemy plane detectors. Finally, in desperation and in answer to repeated criticism, Air Marshal C. F. A. Portal, Air Officer Commander-in-Chief Bomber Command, announced his helplessness in a General Staff conference. Dozens of solutions to the problem were proposed and rejected; most of them he had tried before. At long last, Air Chief Marshal Sir Hugh Dowding, Air Officer Commander-in-Chief Fighter Command, spoke:

"Gentlemen, if there is no adequate defense that can be installed upon the bomber to protect it from enemy fighter planes, why not, then, carry out your missions with the aid of convoys, air convoys just as there are sea convoys?"

"Well and good, Sir Dowding," agreed Chief of Air Staff Air Chief Marshal Sir Cyril Newall, "but do you have fighters

capable of flying alongside the bombers throughout their complete trip?"

"No, sir!" Dowding admitted. "Our fighters have a range of only five hundred miles whereas the range of the bombers is, I believe, in the neighborhood of fifteen hundred miles."

"Portal, if you could have a squadron of escorting fighters do you believe your bombers could get through?" Sir Newall asked.

"I should need many squadrons, sir, but if a fighting plane could be built with a range of fifteen hundred miles, a speed of at least three hundred miles per hour and a ceiling of twenty-five thousand feet, I could promise you a decided reduction in our bomber losses!" Portal promised.

Sir Newall jotted these figures down and before the room had been cleared he had Sir G. Stanley White, managing director of the Bristol Aeroplane Company, on the telephone.

(Continued on page 56)

ECHOES OF THE 1941 NATIONALS

BEFORE the 1941 National Meet grows too old in this dim memory, there are several items we did not have opportunity to mention in past months, which we should like to discuss with you here and now. Anyone who attended the 1941 Nationals could not help but be impressed by the magnitude of the meet. It is not enough to say that there were 1286 contestants—

for every contestant had at least one helper and it seemed that every helper had at least one parent. Add to this the hundreds of Chicago Park District employees who worked so long and faithfully at the contest and you will have a figure near 5,000. For so many people to devote their entire energies to one activity is ample proof of the drawing power of aeromodeling and the important place this hobby-sport has come to play in the lives of thousands of intelligent young Americans who tomorrow will be carrying the torch of American democracy.

As we have lamented before, a meet of this size means it is well nigh impossible to see everything, although with program in one hand and ears attuned to the public address system, we did manage to cover most of the high-lights.

A most illuminating conversation was one overheard between Raoul Hoffman of Chicago, noted aeronautical engineer, and a California entrant. It seems that this

From The INSTRUCTOR

West Coast flyer had developed his own "super-doooper" airfoil which was responsible for phenomenal flights featuring some very fancy glides. Mr. Hoffman pointed out that the airfoil this particular chap was using was not an exceptionally good one and what did account for his outstanding performance was a folding propeller on his gas model. It seems that a few people such as Mr. Hoffman and Mr. Grant, editor of this here publication, realize that a propeller offers almost three times as much resistance as a streamlined fuselage. So for winning flights with gas models, try folding propellers.

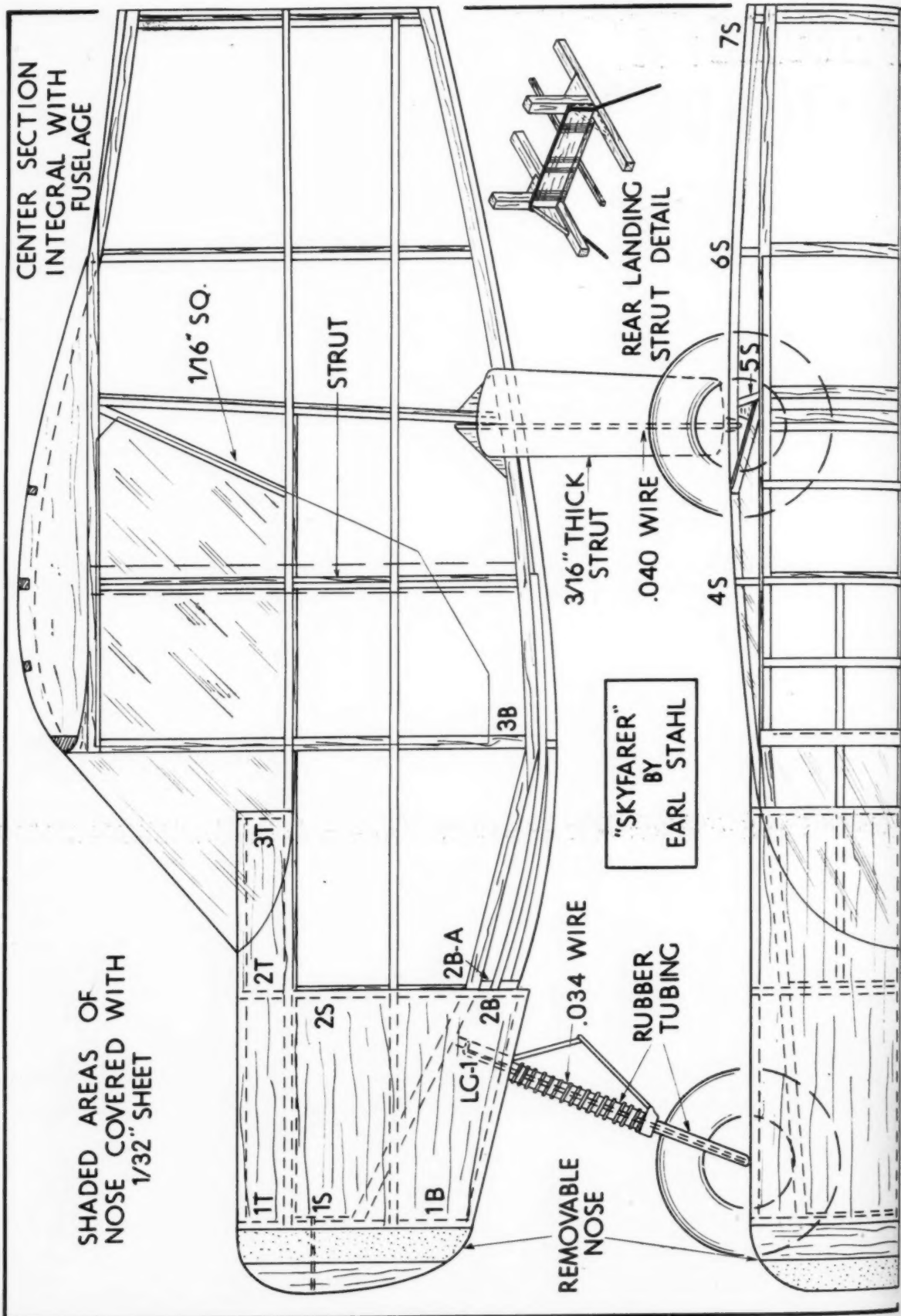
Each year the gasoleers demonstrate greater conception as to what makes a gas engine tick. Bally motors were at a minimum indicating that well-tested powerplants were being used. It is interesting to note that a number of original models were among the high place winners, although many kit models rolled up an impressive score.

Random flash-backs: The march of the model flyers which we trust you saw at your local theater in the newsreels . . . the pre-

(Continued on page 56)



Are you sure the plans are for a model plane?





With three wheel gear it lands like a large plane



The large propeller gives long steady flights



Body is of four longeron construction

A MINIATURE FLYING SKYFARER

A Small Scale Reproduction of the Latest Light Plane—Unusually Stable and Suitable for Contest Flying

By EARL STAHL

RECOGNIZING that the overwhelming proportion of all flying accidents are caused by errors of pilot judgment, the General Aircraft "Skyfarer" was designed to anticipate and make inherently impossible these human mistakes. According to the designer, Otto C. Koppen, professor of Aeronautical Engineering at M.I.T., the Skyfarer cannot slip, skid or spin nor does it lose control when stalled. It is placarded as "characteristically incapable of spinning" by the C.A.A.

The Skyfarer is a high-wing monoplane, seating two passengers side-by-side; it is powered by a four cylinder Lycoming engine of 75 horsepower. Most unusual is the fact there is no rudder—turns being made by the ailerons. The ailerons are operated by a steering wheel which also steers the front wheel of the tricycle landing gear in much the same manner as an automobile. The ship is equipped with flaps which contribute to the control of takeoffs and landings.

In performance the Skyfarer compares favorably with other lightplanes. With a geared Lycoming engine top speed is 100 miles per hour. It climbs at a rate of 550 feet per minute and cruises for 400 miles

at about 20 miles to a gallon of fuel. Because of the tricycle landing gear and hydraulic brakes, landings can be made at speeds from 45 to 80 miles per hour. Other specifications are: Wing span 31 feet, 5 inches; length 22 feet. The useful load is 460 pounds, gross weight is 1350 pounds.

Because of its excellent proportions and interesting construction, this plane is ideally suited for a flying scale replica. The model was developed from data supplied by the manufacturer and is exactly to scale except for enlarged propeller and added dihedral. In spite of its snappy appearance, it flies very well. Standard construction methods are used throughout, so little difficulty should be experienced as your Skyfarer takes form.

Fuselage

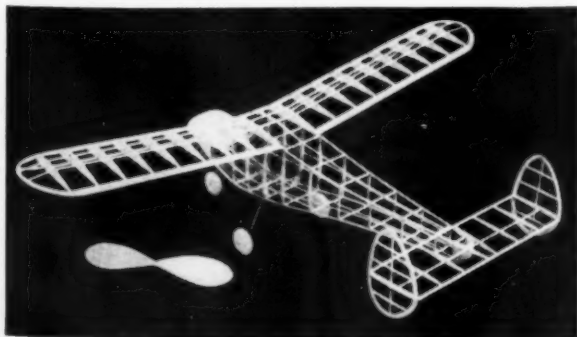
A simple rectangular frame is the backbone of the fuselage structure; it is shown lightly shaded. Work directly



In flight it is most spectacular



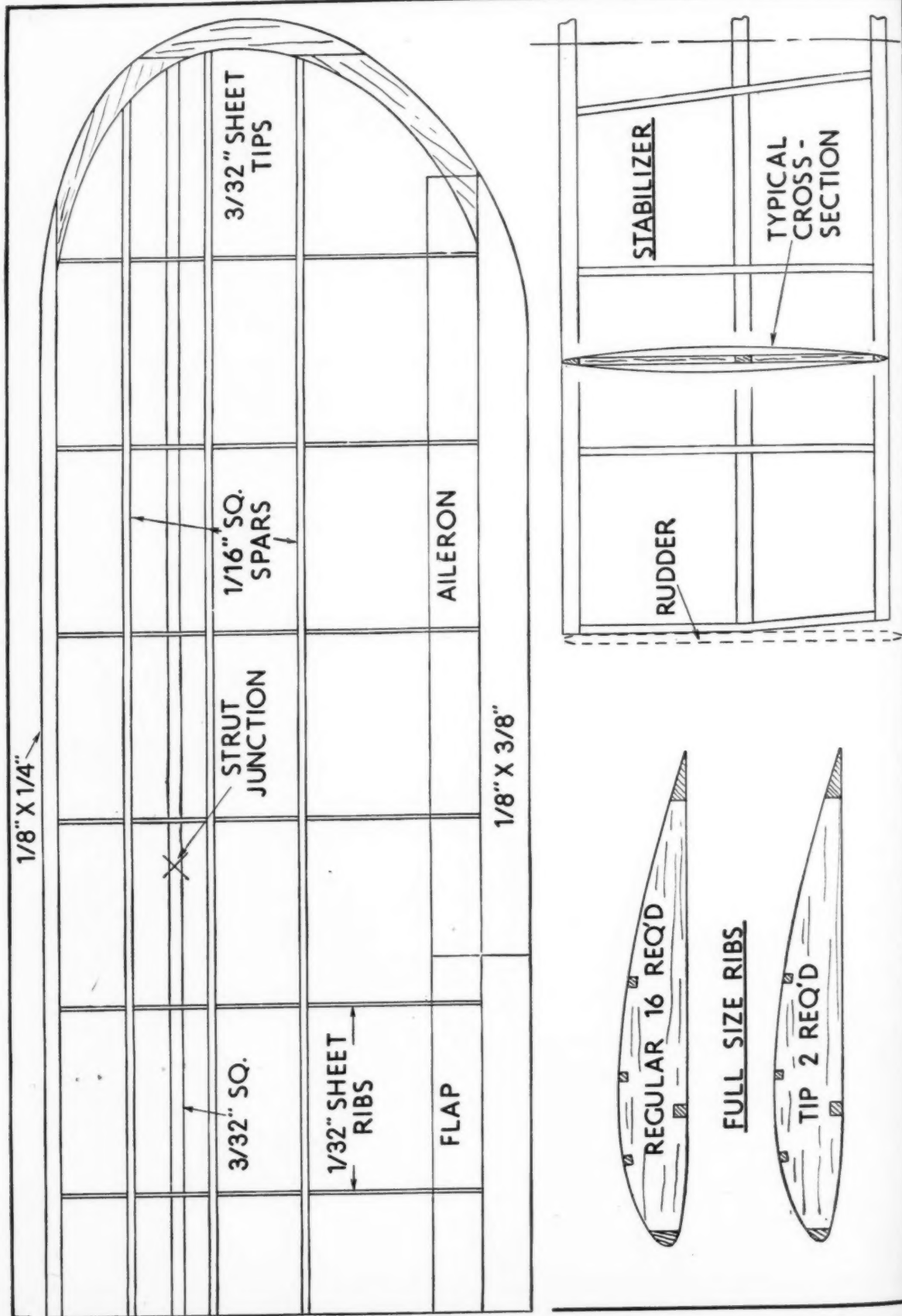
A faithful replica of the big ship



The frame is of simple design and very light



High wing and twin fins give unusual stability



over tracings of the plan and build two side frames, one atop the other to make certain they will be identical. While it is not absolutely necessary, it is best to steam or soak the longerons in hot water so they will dry with a natural curve, as required; this will aid in keeping the structure from springing out of shape. Hard grade wood is used and longerons and uprights are 3/32" sq. stock. Invert the completed sides over the top view and cement 3/32" sq. pieces to place at the body center; when dry, draw the backs inward and place the remaining cross-pieces. It will be necessary to crack the longerons so that they can be pulled into position at the front.

Cut the formers shown on page three of the plans from 1/16" sheet. Now, if the basic structure is dry, remove it from the workboard and attach the formers to their correct positions. The wing center section is constructed directly atop the fuselage; make this very accurately as the wing's correct placement is determined by its position. Since the stringers are merely fairing strips, they should be medium-soft balsa; they are cemented directly to the underframe except where there are formers, of course.

Before the nose can be completed it is necessary to attach the front landing gear fork. A full scale plan of the fork is given. Bend the halves from .034 music wire and then join them by soldering. Align the fork properly against former LG-1; then, using needle and thread, firmly sew it to place. Apply several coats of cement over all the former and adjacent structure.

The rear landing gear strut can be made at this time also; it is bent from .040 music wire. The method of attachment is indicated by the perspective. A 5/16" deep piece of hard 1/16" sheet is cemented to the vertical members at section 5S. The wire strut is then fitted over this member and securely lashed to place by wrapping with thread. Add the triangular 1/16" sheet gussets, shown, and apply several coats of cement. Rubber tubing and balsa fairings are not added until later.

The nose is covered with light grade 1/32" sheet; all the shaded area, as indicated on the plan, is covered. Three or four individual pieces will be required. Cement the sheet to the adjacent frame, using pins and rubber bands to hold it in place until dry. The extreme front of the nose is made removable to permit the rubber motor to be stretched for winding. Roughly cut the nose block to shape, lightly cement to the fuselage and sand the entire front smooth and uniform. Remove the nose block and cement a piece of 3/16" sheet to the back so it will fit to the opening in section No. 1. The rather blunt tail piece is carved from a very soft balsa block; it is hollowed, as shown.

Tail Surfaces

Construction of the tail surfaces is simple. First build flat frames for the two rudders—or rather fins—and stabilizer using 1/16" thick stock for the outlines and 1/16" sq. strips for the ribs. To give the stabilizer a streamline cross section, cement soft strips of 1/16" sq. to each side of each rib and then, when dry, cut them streamline. The fins are of flat construc-

tion. Trim and sand each structure to complete the tail surfaces construction.

Wing

Only the right wing plan is shown so it will be necessary to prepare an accurate plan of the left wing in order that construction can be done directly atop it. With exception of the two 1/16" thick end ribs, all wing ribs are cut from 1/32" sheet. Taper and sand the trailing edges before pinning them into position over the plan. Pin the ribs to their respective positions, then attach the leading edges and spars. Assemble the tip pieces which are cut from 3/32" sheet and cement the tips to place. Once the leading edges and tips are cut and sanded to shape the wing frames are completed.

Propeller

The propeller blank is shown in perspective on the plan. Select a hard block of the proper size and shape the blank as indicated. Drill the tiny hole for the prop shaft before starting to carve a right-hand prop. The hardness of the balsa will determine the blades' thickness, the shape of which can be seen in the photos. Thoroughly sand the propeller and apply several coats of clear dope with light sanding between each coat to produce a nice smooth finish. Equip the prop with some kind of free-wheel device so the glide will be improved. Cement a washer to the back of the propeller, too.

Bend the propeller shaft from .040 music wire. Place several washers between the prop and nose block and then bend a loop on the shaft front into which a mechanical winder can be hooked.

Covering

Being a scale model, it is necessary for the covering to be nearly perfect. With this in mind carefully sandpaper all the structure to remove every bit of roughness. Colored tissue is used and since this is a commercial plane, most any color combination will be correct; our original model was very attractive with its red and black color scheme. Cement cellophane side windows to place before starting to cover the fuselage. The use of numerous small pieces on curved parts will help avoid wrinkles; use only enough banana oil adhesive to stick the extremities of the area being covered. Individual pieces of tissue should be lapped neatly. The balsa cowlings and similar wood parts are tissue covered, too. Use a separate piece of tissue for each side of each wing half, stabilizer, rudder, etc.; wing tips require individual pieces, also. Once covered, all parts are lightly sprayed with water to tighten the covering; to keep the wings and tail surfaces from warping they should be pinned to a flat surface until dry. Clear dope is not applied until later.

Assembly

The various parts are now assembled. A half windshield pattern is given; cut a complete paper pattern and make certain it will fit your model exactly before cutting one from thin celluloid. Avoid cement smears when attaching the windshield.

The landing gear is completed next. Rubber tubing of the correct diameter is slit and slipped over the upper portion of

the front fork. Cement the seam and then neatly wrap light twine or heavy thread about the strut to represent the coil spring on the real ship. Tubing of smaller diameter is slipped over the fork portion of the strut. The structure at the strut rear is represented by thin balsa or bamboo strips. Cut the rear strut covers from 3/16" sheet; these members are of streamline cross section. Cut 1/16" deep grooves in the struts to hide the wires, cement the wires fast; do not, however, attach the tops of the struts to the fuselage. Cover the struts with several layers of colored tissue.

Wheels are made from three laminations of 1/8" sheet or they may be purchased. Cement washers to the wheels so they will revolve accurately and smoothly. Before the wheels are attached to place they should be color doped. The front fork will spring apart far enough to admit the front wheel; rear wheels are held in place by washers soldered to the axles.

Assemble the tail surfaces by cementing the rudders to the stabilizer; cut enough tissue away from the rudders so a solid gluing surface will be had. Remove enough tissue from the stabilizer under-surface so the tail surfaces can be fitted accurately to the fuselage at the position indicated. Attach the wings—this will be an easy matter since the exact position and angle has already been determined. Tips are elevated to the extent of 1-1/4". Now that the model is assembled, a coat of clear dope can be applied to all the covered surfaces.

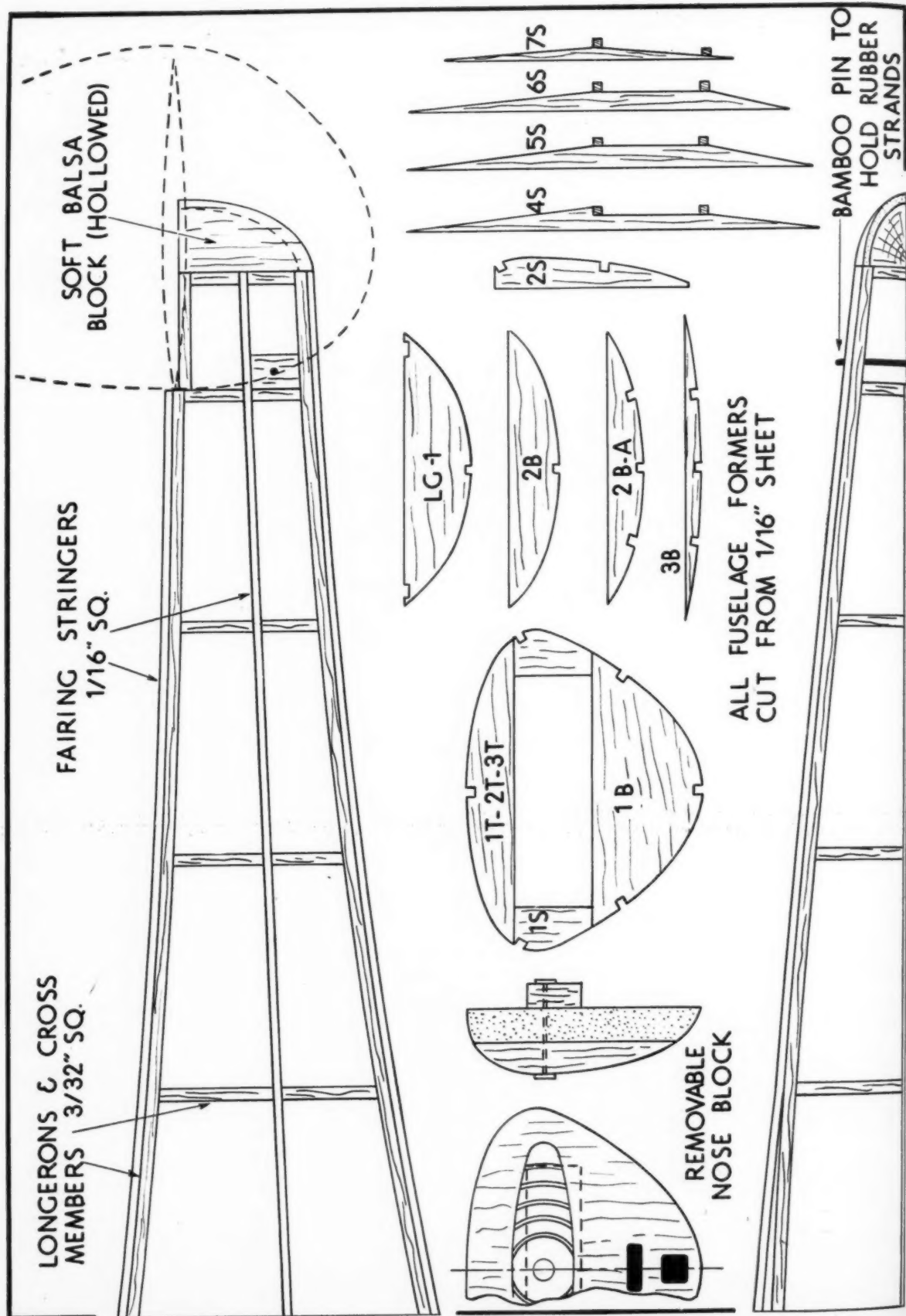
Add the various more minor details to "dress-up" your model Skyfarer and construction is finished. License numbers, fuselage stripes and similar decorations are cut from contrasting tissue; ailerons, flaps, elevator, doors, etc., are effectively represented by thin strips of black tissue. The single wing struts are cut from 3/32" sheet; they are of streamline cross section and join the wing at "X." Struts, propeller and other exposed wood parts are color doped. Air intake openings in the cowl, exhausts and similar details found on photos of the real ship can be added without harming the model's flight ability.

Either 8 strands of 1/8" rubber or 6 strands of 3/16" rubber should be used to power the Skyfarer. Measure the strands to correct length and then attach them to the loop on the prop shaft; drop the rubber through the fuselage and slip the bamboo pin through fuselage so as to attach them in the rear.

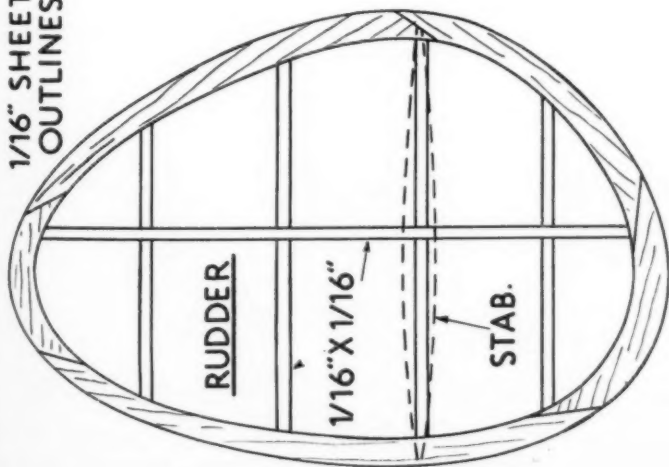
Flying

To prevent damage to the model at this crucial stage, test flights should be made in a field of tall grass, but if none is available make first flights R.O.G. with a few turns. The descent from a hand glide should be flat and smooth before power is applied, so a small corrective weight may be required to obtain the desired results. Once the glide is good, all further adjustments are made by offsetting the thrust line. A small sliver of wood between the nose block and fuselage, tilting the thrust line down at a slight angle, will help eliminate a tendency to stall, while right or left thrust will make the ship turn as desired. Use a mechanical winder for

(Continued on page 44)

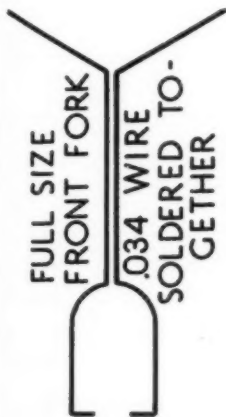


1/16" SHEET
OUTLINES

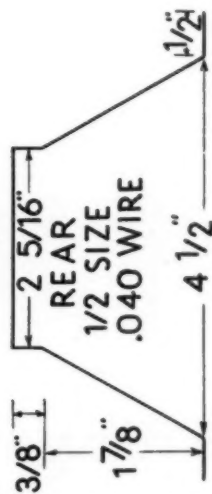


FULL SIZE
FRONT FORK

.034 WIRE
SOLDERED TO-
GETHER

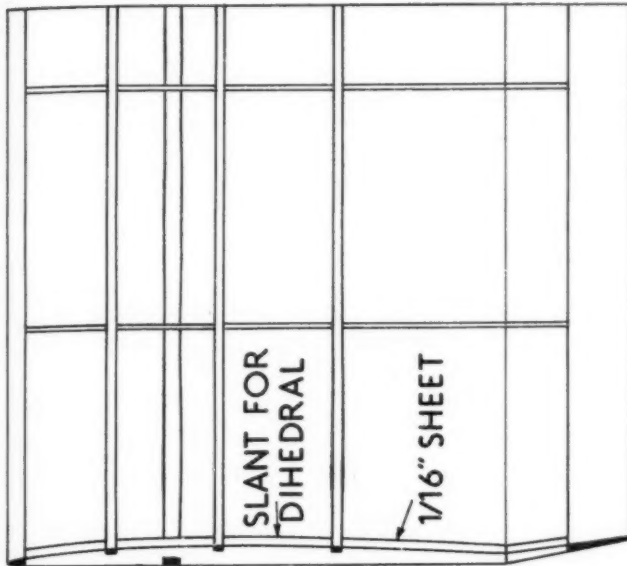


LANDING GEAR
DETAIL



SLANT FOR
DIHEDRAL

1/16" SHEET

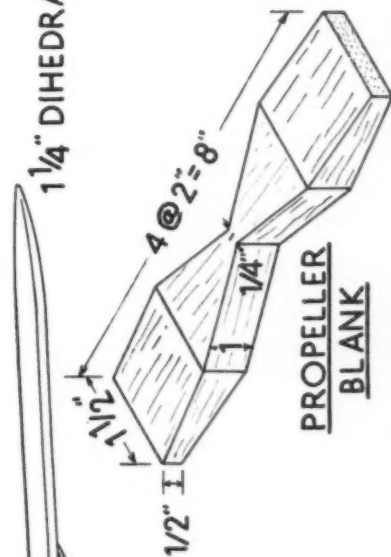


JOIN TO
WING

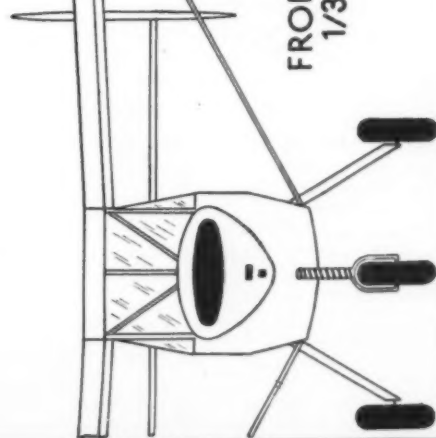
1/2 WINDSHIELD
PATTERN

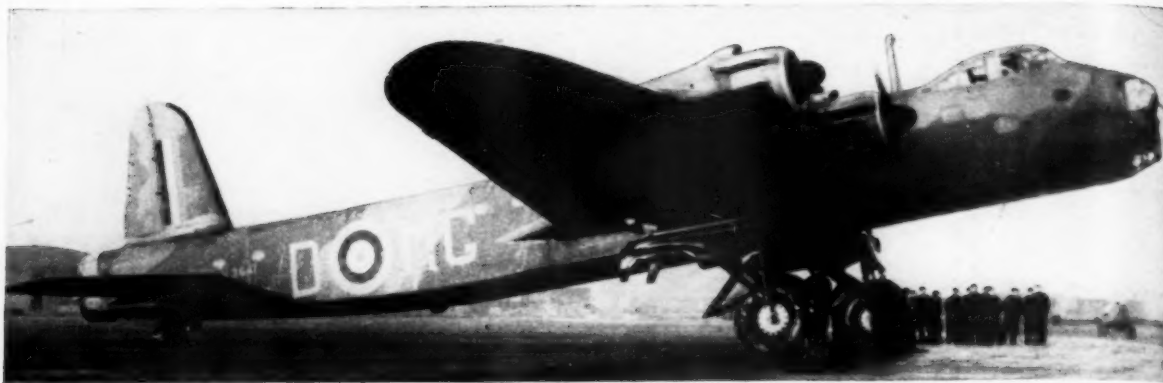


1 1/4" DIHEDRAL



FRONT VIEW
1/3 SCALE





The Short "Sterling" heavy bomber, one of the types that is handing Berlin furious bomb lashings. With a span of 99 feet it is driven by four radial engines and is heavily armed

SPIKING the widespread belief that the aircraft manufacturers are quickly becoming fabulously wealthy men, Donald Douglas and J. H. Kindelberger, two of the largest producers of military aircraft in these United States, recently testified before the Senate Defense Investigation Committee that their firms are losing money, lots of it, on Government contracts.

"The B-19 cost \$3,970,685 to date," stated Donald Douglas, head of the vast Douglas Aircraft Company, "and we received government reimbursement of only \$1,450,000." He further stated his company lost \$1,142,651 in 1940 and has lost \$1,840,882 the first six months of this year on government contracts.

"We are losing about 20 percent on



Special To Model Airplane News

Army bomber contracts," testified J. H. "Dutch" Kindelberger, head of North American Aviation. Only on commercial and export contracts has their company made any money, they stated collectively. This would include British orders on which work is progressing rapidly at both firms.

Further committee investigations brought to the stand Robert Monroe, North American purchasing agent, who stated there was a growing shortage in basic metals, and Gage Irving, vice-president of Northrop, who stated his firm was

experimenting with magnesium and he believed that airplanes can be built completely of this metal.

Squadron Leader Eric Roe, son of England's first pilot, was listed as missing when the 25-year-old squadron commander failed to return from a fighter mission. He is the son of Sir Alliot Verdon-Roe, who flew a home-built plane in 1908, and, as head of the famed A. V. Roe Company, builders of the Avro type airplane, has contributed greatly to British aviation achievement.

(Continued on next page)

AIR YOUTH OF AMERICA

News of Importance to Modelers



WHAT'S your school doing in model aviation?

Some of the most active and interesting model airplane clubs in the country are those that meet in school workshops and classrooms after study hours are over. Organized in most cases by students who have been bitten by the model plane bug, these clubs recruit new enthusiasts from the entire student body. The shop work teacher or some other instructor acts as faculty advisor or club leader; building projects are undertaken by the club as a unit; model plane exhibitions and contests are planned. A well planned schedule of activities rounds out a fine winter's pro-

gram until the warm weather comes again, and the big contests get under way.

Take the model plane groups in the Pittsburgh schools which have been built up under the leadership of M. J. Thomas, for example. One of the veteran leaders of model aviation, Mike Thomas, has been one of the missionaries of model aviation for years. As an instructor in radio and electrical shop work, Mike was one of the first to see the importance of model aviation in making youth air minded.

Starting with a group of rabid model plane enthusiasts, Mike Thomas organized one of the first model plane clubs in his section. From this beginning came "Model Wings," a squadron of model clubs in Pittsburgh, of which he is guide, counselor and friend. There are now five units to "Model Wings," and an active schedule of contests

(Continued on page 32)



This Air Youth Club member has won his apprentice wings

The muddled situation at Sunnyvale, California, was at last cleared up when President Roosevelt signed a bill transferring control of the former Naval lighter-than-air station, now known as Moffett Field, to the Army Air Corps through the War Department. However, the bill still authorizes the Navy to spend \$6,500,000 to re-establish the field as a Naval training station in the event the Navy Department so desires.

Captain Bruno Mussolini has been killed in the crash of an experimental long-range bomber he was testing for use with his squadron. A well-known figure in aviation, both commercial and military, he was most widely renowned as a bomber pilot having flown bombers in Ethiopia, Spain and in the recent Greek-Italian campaigns. Son of Il Duce, Bruno and his brother fought side-by-side through many hours of air action and, although only 23 years old, had won many citations for bravery.

According to uncontradictable sources, Japan has only from three to five thousand serviceable military airplanes and only about five thousand pilots. Her air industry is ridiculously weak and her fliers are utterly incapable of conducting first-class air operations. Her air force is anything but a factor in her threat of aggression against the United States.

Testifying to the dependence upon the reliability of American-made Bombers for Britain, Lord Halifax, British ambassador to the United States, recently flew to England on a non-stop ferry flight across the Atlantic. He flew there for brief conferences with Churchill and the King after which he will return to Washington.

Pan-American Airways, after almost a year of research and training, has been awarded a contract to ferry American-built bombers to the Royal Air Force in Africa and the Middle East. Thus, a direct air-line from Florida to South America to Africa and thence to Syria and Iraq has been established.

Proof that commercial aviation is still in business was offered when Henry S. Turner, president of Interisland Airways, Ltd. of Honolulu, P.I., took delivery on three Douglas DC-3 twenty-four passenger airliners to augment the six Sikorsky amphibians now in service in the Islands. Because of the defense boom in Hawaii, air traffic has increased to a point where the new equipment was deemed a necessity. Landing fields are being improved and enlarged to accommodate the huge airliners with a recent government appropriation.

Ten new buildings are under construction on the recently purchased Naval Air Base at Los Alamitos, California. The base will be used for the training of Naval Reserve officers and will accommodate 180 fledgling pilots at one time. Other buildings will include administration, hangars, assembly and repair shops and a garage.

Lockheed's newest fighting plane will be a two-seater version of the famed "Lightning," twin-engine interceptor. The additional member of the crew will be a rear gunner housed in a multi-gun turret. The planes have been ordered for the Royal Air Force and the first production model

will be in the air soon. The last of the widely renowned "Hudson" bombers will soon be completed and the bigger and more powerful "Ventura" will take its place in the assembly lines. The Ventura is a military version of the Lodestar and features a belly gunner housed in a long, streamline emplacement and clam-shell landing gear doors. The huge "Constellation," giant four-motored super Luxury airliner, is now under construction, the first of six such giants. The plane has been renamed the "Consternation" by the workmen due to difficulties attendant with the construction of a new, experimental model.

Two disasters marred the records of the Air Corps' giant air base at March Field when a huge North American B-25 attack-bomber crashed en route to the base and burst into flames during a take-off. James H. Knight, crew chief of the plane was killed in the crash while pilot W. B. "Tex" Wild and Co-pilot Paul Penrose escaped with serious injuries. Cause of the crash was tentatively attributed to the loss of a flap segment while preparing for a landing. The other accident involved the mid-air collision of two primary training planes on a routine training flight. The dead were 2nd Lt. J. A. Mitchell, Sergeant R. E. Stafford, 2nd Lt. E. A. Hose and Private J. D. Glenn. The men were all members of the 49th Pursuit Squadron, 14th Pursuit Group and were doing instrument work in company with a third plane which returned to the base safely.

We chatted briefly with Glenn L. Martin on his recent visit to Los Angeles, his home town from which, almost thirty years ago, he made his first airplane flight and succeeded in negotiating the mainland-to-Catalina island over-water route in his own airplane for a record flight. About the war he told us: "It is a long, sad and tragic war and it will be some time yet before it is over. I think it will certainly last two or three more years but the aggressors can't possibly win." About his company he announced that a new Martin plant is under construction at Omaha, Nebraska where only B-26 bombers will be built. "We have 743 million dollars' worth of orders and all of it for military planes. I can't tell you much about production figures as that's a military secret," he declared. However, he did say that at one time a few days ago there were 126 medium bombers on the field awaiting propellers! Yes, he WAS dressed in his usual natty blue double-breasted pin-stripe suit!

Did American planes win the battles in Iraq and Syria? It was recently disclosed that American-made Douglas DC-2 and DC-3 twin-engined transport planes requisitioned from the airlines and from the aircraft factories flew huge numbers of British troops into Iran where they formed lines to protect the British colonies in the rich Persian oil fields. The troops, under the command of General Sir Archibald Wavell, were not parachute troops, but were landed deep in the interior in untold amounts, the empty planes returning for fresh loads for hours on end.

Kinner now has an engine backlog of \$3,800,000 and Menasco has a backlog of over \$4,000,000, all of which are due to go

into Ryan monoplane primary trainers for the Air Corps training bases around the country.

Wing Commander Douglas R. Bader has proved, indirectly, that chivalry in the air is not dead, even in the face of the merciless ground warfare of the Nazi armies. Bader, leader of an R.A.F. squadron known as "Bader's Bus Service," has fought this war from the cockpit of his plane with an aluminum artificial leg. During one day's fighting, his engine was hit and he was forced to land in enemy territory. In the ensuing crash his leg was badly, and irreparably bent. So it took a special "truce" while his Squadron flew over his prison camp and dropped his new leg, one of those rare interludes of gallantry in an all-out war of destruction.

Another interesting story coming to us from England concerns Pilot Officer Bono, a California volunteer in the R.A.F., and Pilot B. Olsen, an Idaho volunteer. Members of the American Eagle squadron, Bono and Olsen were returning from a raid on enemy-held territory when Olsen's plane was attacked by a Messerschmitt. Bono came to his rescue and destroyed the Nazi only to notice that Olsen's plane had been hit and he was preparing to make a crash landing in German-held France. Quickly, and against regulations, Bono radioed: "Keep on going, you've got plenty of altitude!" and Olsen stretched his glide towards England. He dropped into the Channel where a British rescue boat picked him up and returned him to English soil—safe!

Chatted with George "Tony" Schwamm, whose true stories of aviation adventure sound more unbelievable than popular fiction. Recently, while flying an exploration plane in Alaska his motor quit and he prepared for a ducking in the cold waters of the Bering Sea but just as he was to hit the water, the landing gear of his plane bounced off the back of a spouting whale, the engine caught and he returned to the airport. Believe it? Then listen to this one: While flying a few years ago in Kansas he was caught in a cyclone and forced to land. The mounting wind grew to such intensity that small trees and bits of wood started flying past him. Single-handedly he tied his bouncing airplane to a tree and took off after the 100-mile wind had died down. He recently was so badly injured in a crash during a circus air meet that doctors said he could not possibly live. But live he did and his astounding adventures have made the headlines throughout the world.

The first American casualty in occupied Iceland occurred in a non-military (enemy action) crash taking the life of Lieut. George E. Meeks of the 8th Pursuit Group, formerly of Mitchel Field, Long Island. His plane nosed over while making an attempted landing at the airport near Reykjavik, Iceland.

Two Russian-built Consolidated flying boats are now in this country, having flown a total of 47 Russian technical men from the vicinity of Moscow. Head of the mission, which seeks to establish a flow of aircraft to Russia, is Commander Michail Gromoff, familiar to many Americans as the leader of the great Moscow

(Continued on page 52)

New!! Folding Gas Model Props

Recent wind-tunnel tests prove that the propeller has 200% more drag than the fuselage on many models! The only way to improve the glide on today's models is with a folding prop. Try one and see the difference. An absolute contest necessity.



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Air Youth of America

(Continued from page 30)

are held all through flying weather.

Quick to sense the importance of what Thomas was doing, the Pittsburgh school authorities cooperated by setting up a course in model aviation construction as a full fledged accredited course of study. With Mr. Thomas as instructor, this pioneer course was given last year at the Latimer Junior High School. Interest in the project was widespread, inquiries coming from many other cities as to how it was conducted. Because of its success last year, similar courses will be started this fall in Pittsburgh on a city wide basis, with Mr. Thomas as the supervisor.

There are two basic courses: The first is for beginners and takes the novice through a series of four simple rubber powered planes. The second teaches fundamentals of the operations of a two-cycle gas powered engine, and building a model plane designed for engines. So popular have Thomas' courses been that a local newspaper has put them into print and copies have gone like hot cakes, with more than one hundred thousand already distributed.

A model plane flying field on the outskirts of the city, which fliers can use whenever they want, is another project for which Mike Thomas is responsible. Arrangements at the flying field are set up so that spectators and contestants each contribute in a small way to the field's upkeep, and there's enough cash left over to help with the cost of prizes and other incidentals.

Club Sponsors Photography

Another outstanding aviation club is in the Bensonhurst High School in Brooklyn, N. Y. This group is led by Miss Edna Harris; aerial photography, map reading, talks by famous aviation figures, trips to airports and similar activities are featured.

Last winter a number of the boys took the course in model building given by Air Youth of America. Since then some have been specializing in aerial photography, taking and developing their own photographs.

Air Youth Club Program Open to All Schools

Many active model plane school groups are using the Air Youth handbooks and project materials in developing their activities. To meet the many clubs' requests for permission to become directly affiliated with this national program of youth aviation activities, a plan for club affiliation has been prepared by Air Youth. The plan is similar to that which has already been worked out in Texas, under the H. R. Cullen Fund. All groups or clubs interested in junior aviation activities are eligible to affiliate with Air Youth. Requirements are simple. First, the group must have at least ten members; second, there must be some sort of adult sponsorship, by a civic or educational organization. This sponsorship may come from a service group such as an Exchange Club, a Kiwanis, or a Legion group, or it may come from a school, or from simply a committee of interested

adults. Club charter, membership pins and identification cards are provided by the national organization. Gold, silver and bronze wings are given to members in recognition of the completion of specific achievements.

If your school or group is interested in further information about the Air Youth club plan, write directly to national headquarters, Air Youth of America, 30 Rockefeller Plaza. A booklet explaining the plan in detail will be sent to you.

Who's Who in Model Aviation

(Continued from page 10)

Bruno Marchi

get home in a hurry.

Marchi is believed to be the first New England aeromodeler to discover the proximity of Canada and his yearly appearances at the Canadian Nationals in Toronto were the forerunner of later large-scale American participation. As a member of the J.A.L.'s "Experimenters' Club," Marchi never confined his work to any one type of model but designed and flew indoor, outdoor and gas models in competition with equal success. In addition to holding numerous national records, he was the first president of the Boston Gas Model Society which was formed as a unit of M.A.N.'s International Gas Model Airplane Association to fight the Massachusetts ban on gas models' flying. Protest meetings were held on historic Boston Common and after considerable maneuvering, plus assistance by N.A.A., the ban was lifted.

Before going to Washington to handle technical work for the Academy of Model Aeronautics, of which he is a charter member, Bruno conducted problem sessions in aeronautics at Wentworth Institute, broadcast a weekly aviation program over station WCOP in Boston and compiled several booklets, "Elements of Aviation," which were used as texts by Prof. Hilding N. Carlson during a series of international aviation lectures over short wave station W1XAL (now WRUL).

Now he is in the Army serving Uncle Sam.

Jesse Bieberman

come true with the development of the A.M.A. and its subsequent supervision of all model work for N.A.A. Jesse expresses greater satisfaction with the latest competition rules and admits that as an individualist he is seldom completely satisfied with any regulations although he recognizes the need for some restrictions in model activity.

Mr. B. expects to see indoor durations go to 30 minutes within the next few years if the boys keep plugging and can obtain proper indoor flying facilities. In this respect it is to be noted that Jesse has been most successful in obtaining permission for indoor record trials at the Lakehurst, N.J., airdock before the present emergency period was proclaimed.

Jesse is a member of the Academy's radio control committee and says that model builders should back the Academy in all that it does "if they want the game to progress." Jesse has been an amateur radio operator ("ham") for the past 10 years

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Send 15c postage for the big new 1942 Megow Hobbyscraft Catalog just out, and for special information on all Megow warplanes.

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LITTLE REBEL

LITTLE REBEL

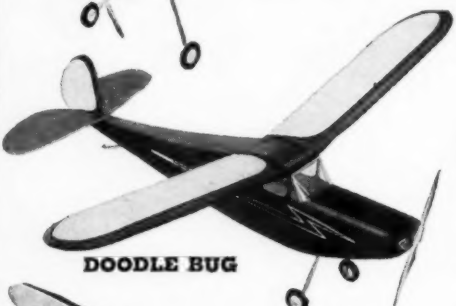
Here's a model that's easily made, and yet performs with the best. Wing is fastened by rubber-to-dowel method. Colors: orange and blue.



AIR RAIDER

AIR RAIDER

Here's a model that's worthy of its place in the "Fleet." Polyhedral wing can be made demountable or fastened permanently in place. Colors: brown and yellow.



DOODLE BUG

DOODLE BUG

Typical of the popular light planes of today. Demountable wing is fastened by rubber bands which hook to dowels set in the fuselage. Colors: Red and yellow.



BLUE PHANTOM

BLUE PHANTOM

An eye-catcher—on the ground, and in the air! Wing has wind-downs on both sides of the open cockpit for visibility. Gullwing, single-seater type. Colors: Two-toned blue and white.



SKIPPER

SKIPPER

Its snappy low-wing, neatly faired into the fuselage sides, and the tri-cycle landing gear, marks this model as up-to-the-minute! Colors: blue and yellow.



WIZARD

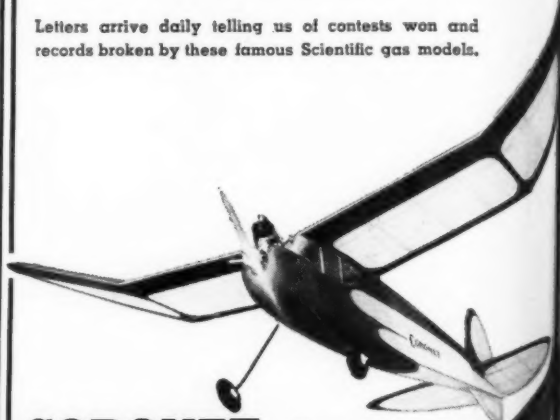
WIZARD

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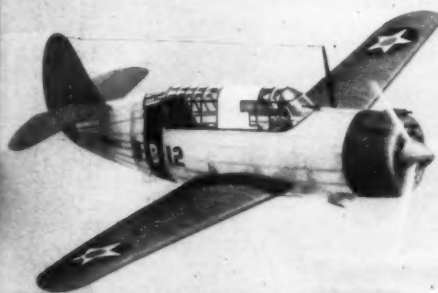
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Double-purpose Soaring Glider!

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By actual test, Smith Coils deliver more spark intensity . . . longer . . . and therefore at less cost than any other make. Follow the choice of leading engine manufacturers, model airplane builders, hobby dealers, and race car fans by using the best-known miniature ignition . . . best-made by Smith.

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Smith Firecracker	2 1/2 oz.	\$2.50
Smith Competitor	1 1/2 oz.	1.75
Smith Big Shot	5 oz.	3.00

Write for descriptive literature!

SMITH COILS

NATHAN R. SMITH MFG. CO.
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SOUTH PASADENA, CALIF.

and as such has much in common with other model leaders like Capt. Willis C. Brown of Boston and the Good brothers of Kalamazoo, Mich.

John T. Dilly

(Continued from page 10)

has held office in the Galt Glider Club.

In '34 John appeared at the Akron Nationals with the first ball-bearing washers used on models, "according to reliable authorities." His experiments and success with colored microfilm for flying semi-scale craft so popular in Canada have also attracted attention. John is partial to rubber models and would like to see more research and experimental work in that field.

His suggestion to younger builders is "No flying scale work until proficient!" Less experienced enthusiasts, says Dilly, should be started off right with models that will give them performance with a minimum of labor—simple outdoor stick models that will keep interest from lagging.

When last heard from Dilly had been commissioned by the Canadian government to design and build a small wind tunnel which could be used to familiarize young aviation enthusiasts with the principles of aerodynamics. Models were to play a part in this training, too, so here again is proof that model aviation has an important part in the education of those who will fly the skyways of tomorrow.

Academy of Model Aeronautics

(Continued from page 17)

issued by the A.M.A.

Benefits of being certified include each such club member receiving gratis each month a copy of the Academy news bulletin, "Model Aviation." In addition, the certified chapter is elevated in the minds of modelers and the public alike as a 100% A.M.A. club and consequently in step with the Academy's fly-safely campaign.

A.M.A. Council for the District of Columbia

An association of model airplane clubs in and around the nation's capital city has been formed under the leadership of Russell Nichols, administrative leader-member of the A.M.A. The organization has already done considerable "educational" work in bringing model aviation to the attention of service clubs and educators in Washington, and held a successful theatre party at which was shown "Youth Takes to Wings" in addition to other special features in Washington's new Apex theatre.

This council marks another in the chain of club-combines which are being established in large metropolitan areas. Philadelphia has an A.M.A.-recognized model aviation council sparkplugged by Phil Zechitella and the Milwaukee Model Aviation Council has been in successful operation for more than a year and includes many of the city's outstanding citizens and model leaders.

Another National Trophy

An indication of how local merchants view the National Model Airplane Meet as an incentive to business generally is the offering of awards for the annual aero-

modeling classic by dealers.

This year for the first time Philip J. Corr, of Corr's Sport Supply, 812 Ninth Street, N.W., Washington, D.C., offered a very fine trophy in the 14th National Model Airplane Meet, which was then put up for competition in the outdoor rubber-powered events. However, following the competition the various listings of winners which appeared gave credit to Mr. Corr with several pseudonyms—such as "Gorr," "Gort," "Cort," et cetera.

Mr. Corr wishes to announce that the family name which has been associated with the model and cycle business of Washington for 40 years or more is still "C-o-r-r."

A Profile Three Wheeler

(Continued from page 9)

interest.

Before starting construction, the beginner should study the drawings thoroughly; this will aid in construction and will convince him it is very easily made.

Fuselage

As you know the fuselage is profile; this type of construction is very simple and requires very little time. The body pattern should be transferred on a piece of 1/16" sheet medium-hard balsa. When the fuselage's true form has been cut out, lay it down on a flat surface and cut out the center section for the rubber motor.

The cabin is cut out in like manner; later add the 1/16" square braces and the small strip of balsa which forms the contour of the cabin. It's a good idea to use a straight edged instrument while cutting out these sections. The nose is constructed next; it consists of two pieces of 1/4" sheet, one on each side. After these have been placed in position and have thoroughly dried, they are cut and rounded to fit the nose contour, by using a razor blade and a piece of sandpaper. A small notch at the bottom of the fuselage is cut out for the lower wing placement.

The nose plug is a standard hardwood plug with the end cut to a 1/16" thickness.

Make two clips from No. 8 piano wire, these are cemented to each fuselage side around the center section which is cut for the rubber motor. These braces hold the body in position while the model is fully wound. The rear hook may be added next, bent from No. 11 wire, and is cemented in position. Wrap this hook with thread to insure a lasting fit. One very important thing is to sand down all sections for lightness. To get the best results in flying ability, weight has to be reduced to a minimum.

Wings and Tail Surfaces

The wings are of simple construction, cut from 1/32" sheet balsa. A complete plan view of both right wings are shown. Trace these patterns on to the sheet balsa; this may be applied to all other surfaces. Both wings are cut from 1/32" sheet medium-hard balsa; each is in halves, later joined at the center. They do not necessarily have to be joined until assembly starts. After they are cut out and completely sanded, they are warped into correct position by placing them over a heated stove; the best method is to hold the wings in the correct contour. After they have

THE NEW *Records* ARE MADE WITH THE **TIGER AERO MOTOR**

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TIGER AERO motors in the hands of model builders are winning ever increasing FIRST prizes in the Nation's most widely attended contests.

Latest reports for August competition show Frank Pace FIRST in Class C at Hudson Valley Championship, Poughkeepsie, N. Y. Highest flight time 22 minutes with TIGER powered Zipper.

On Aug. 17th seventeen year old Gerald Holly wins FIRST with total flying time, 63 min. 8 sec. at Ypsilanti, Mich. TIGER powered airplane of own design with 4 1/2 sq. ft. (648 sq. in.) wing area.

From Arlington, Va. comes news that William Barclay wins FIRST place and United Airlines trophy with his TIGER powered Cleveland Playboy Sr.



Gerald Holly achieves total flying time, 63 min. 8 sec. in Michigan contest with TIGER engine.

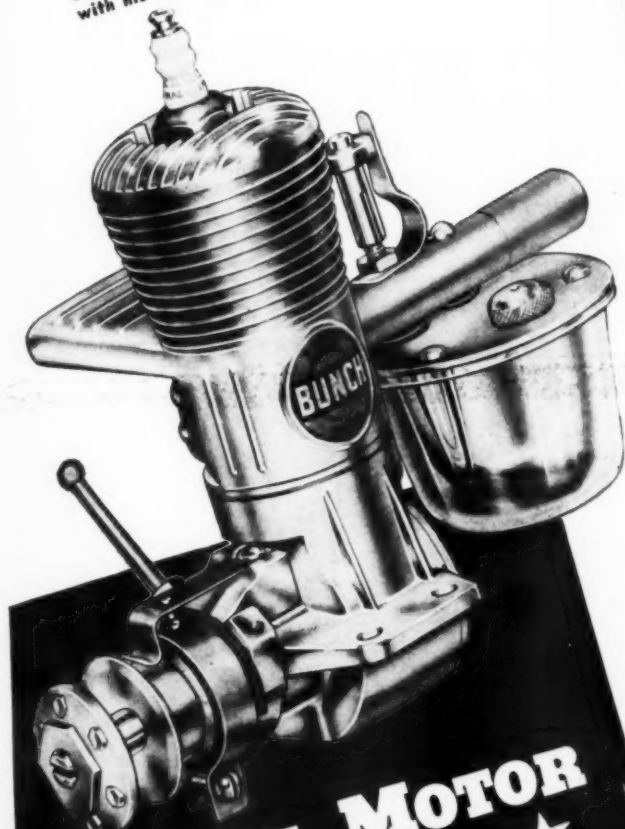


TIGER AERO WINS TRIPLE FIRST CALIFORNIA STATE CHAMPIONSHIP

SAN FRANCISCO EXAMINER REPORTS: Complete results of California State Fair model airplane competition, Sacramento, Sept. 1st and 2nd show CHARLES WERLE annexed FIRST honors in three classes of adult competition.

CHARLES WERLE SAYS: "Realizing success depended largely on the motor used, I installed a TIGER AERO in my A. J. Fireball. Smooth, steady performance enabled me to score a decisive win in the (1) Precision Flying Event, (2) Aerobatics Event and (3) Speed Event. A clean sweep—congratulations on your fine power plants."

BUNCH MOTOR COMPANY SAYS: "Congratulations Charles Werle; you must have used excellent judgment and skill to win first in all three events in the official statewide meet."



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SPARK PLUG WRENCHES

Seamless steel tubing, finest obtainable. Punched with inside and outside dies. Cadmium plated to prevent rusting. Four sizes: Large for V Champion; Medium for Brown, Hurlman & Blue Crown; Small for V-2 and Extra Small for V-3. Medium size also fits propeller nut. Look for Junior Motors stamp on the product. Price only 20c.



CHAMPION SPARK PLUGS 50c

These famous plugs need no introduction and are used as standard equipment on Junior Motors. Three sizes: V, V-2, V-3.



FLYWHEELS \$1.50

Machined from High Grade Alloy Steel, free from flaw or defects. Balanced and Cadmium plated to prevent rust. Weights: 7 oz., 11 oz., 14 oz., & 6 1/2 oz. (Brownie)

STEEL CONNECTING ROD FOR MODEL D JUNIOR MOTORS \$1.00

Drop forged one piece hi-grade special Alloy Steel.

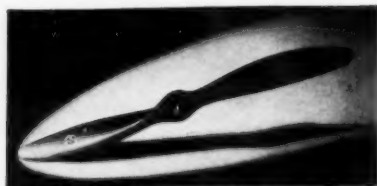
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CONDENSER 20c

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JUNIOR MOTORS PROPELLERS

No internal combustion engine, regardless of the number of cylinders, will run smoothly without a properly designed propeller. With this in mind, Junior Motors Corporation engineers have designed a propeller exactly suitable to miniature aircraft engines. They are presented here in three price ranges. We especially recommend the Deluxe Birch Propeller.

The following propellers are available in sizes from 8" to 14". Please specify type when ordering.

JM Standard Gum Wood Propeller.....	13c
JM Lacquered Gum Wood Propeller.....	25c
JM Deluxe Birch Propeller.....	35c

Junior Motors Corporation
Philadelphia

been bent, check on their likeness, by placing one over the other.

The tail assembly is also constructed of 1/32" sheet medium-hard balsa. Take care while cutting out the rudder to eliminate the chances of splitting the wood. The stabilizer is made in two pieces and cemented to each fuselage side. Be doubly sure these surfaces are lined up perfectly when assembly starts. The rudder is simply placed on the fuselage top.

Propeller and Landing Gear

The landing gear struts are bent to required size using No. 11 piano wire. Place the wire over the full size pattern and bend to shape.

A small piece of 1/16" sheet balsa is placed on top each strut, this is threaded, glued and later placed on the wing underside, as indicated on the drawing. The gear is made in such a manner it will take up the shock of landings. A pair of hard wood wheels, 5/8" in diameter, are slipped into place and held in position by adding a drop of cement at each axle tip. When completed the landing gear has a tread of 3-1/8". Make the front gear from No. 11 wire; the wire is extended up into the fuselage and held secure by placing two bent pins, as indicated on the drawing.

The propeller can be cut from a block 5" x 1-1/2" x 5/8" medium-hard balsa. If desired a machine-carved propeller can be used. The propeller in the photographs is smaller than herein specified. It gives a better scale effect but is less efficient in flight. For scale effect cut from block 4-1/2" x 7/8" x 3/8".

Assembly

After all parts have been completed and sanded down the assembly starts.

First add the tail surfaces, which are in three pieces. The stabilizer is simply placed on each fuselage side, and the rudder on the fuselage top. These are lined up correctly and allowed sufficient time to dry.

The wings are next; these are placed on top of the cabin and at the lower fuselage section. A good method of holding wings in position is by use of pins. Glue the wing on securely and then add dihedral. Dihedral dimensions are: top wing is elevated 1" at each tip; lower wing, 1/2" at each tip. It's best to add small objects under each wing panel to hold them in position while drying; be doubly sure both have the same angle of attack. While the wings are drying be sure to place them where there is no possible chance of being accidentally hit before the glue has a chance to harden. The struts are not added until the wings have dried.

The landing gear should be added next. First place each strut on the lower wing, these are glued in position using a considerable amount of glue. The front gear is also added and glued, this strut should be secured properly to take the strain of landings. The small accessories, such as, wheels, celluloid for cabin, two wire braces on fuselage, etc., are next. These complete the assembly.

Flying the Model

Before adding power to your model try to find its true flying characteristics, by gliding it.

After the model has obtained a correct

gliding angle, the power is added. This consists of four strands of 1/8" flat brown rubber; more or less rubber may be added according to your model's flight characteristics. Wind the prop a few times and launch, watch its flight carefully. If the model tends to pull to the right because of torque, correct this by warping the rudder or wing tips in the opposite direction. Any tendency to dive or stall may be corrected by adding a small weight in the nose, or warping the stabilizer either up or down.

For long flights where a winder is used to store up energy, simply tie a loop at each end of the motor and rig, without slack using an "S" hook.

After final adjustments have been made wind it up and watch some real flights. Because of its lightness, it's best to fly it in very calm weather. Now you're all ready for long hours of flying pleasure. Good luck!

Bill of Materials

(All balsa medium-hard except where otherwise specified.)

One sheet of 1/16" by 2" by 18" for fuselage.

One sheet of 1/32" by 2" by 18" for wing and tail surfaces.

Small piece of 1/4" sheet for nose assembly.

One strip of 1/32" by 1/16" for wing braces.

One pair of 5/8" hard wood wheels and one 1/2" wheel.

One foot of No. 8 piano wire.

Two feet of No. 11 piano wire.

One nose plug, celluloid, washers, prop, glue, pins, sandpaper, rubber, pliers, etc.

Nationals High Time Class A Winner

(Continued from page 13)

tested. The 1940 Bantam was the power used, but an "A" motor of similar displacements will prove satisfactory. A nine inch Standard Ritz propeller was found the most efficient for the design used.

Now???? The building of the "crate". The ship is a simple job to construct; it consists of a crutch around which is built a triangular crosssection. The ship, as mentioned before, which won the Nationals, was built in two days; however, this did not include the time to design and draw the plans as did the first plane.

This job will be the most difficult, so we suggest to lay your hands on some paper, any paper, for by the time the ship is built the plans will be a mass of glue and dope, and draw the plans up to full scale. All the utensils required for this operation is a ruler, pencil, eraser and a little patience. After two hours' work the plans should be enlarged and construction finally begins. Now for the next ten minutes sit back and admire your masterpiece.

All set???? Grab your "meat chopper" and dig in. With the help of this article little difficulty should be found constructing fuselage and control surfaces; follow the plan and instruction and the ship will prove to be a consistent flier, as well as a winner. The record of the Aërbo up to date is thus; any additions to this record by yourself would certainly prove the worthiness of

R.P.M.*

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The new era in "A" flight is upon us... the advent of Super ATOM was dramatic proof that new achievement ceilings had been established for miniature gas engines. ★ The strikingly original design has blazed across the sky to shatter outmoded theories and traditions which were becoming a throttling bottleneck to advances in model aeronautics.

★ There's courage and daring AND originality in Super ATOM! It is lean, tough—slender as a reed—like no other engine today! ★ It slices a meteor-like path through the air to outclimb, outspeed, outfly engines with twice its displacement (.097 cu. in., 1/8" bore and stroke). ★ It's lighter—by precious ounces—than any power plant hitherto perfected for actual flight (2 ounces overall including spark plug and tank!). ★ Super ATOM has consistently developed GREATEST POWER TO WEIGHT RATIO! There is none its equal in this vital specification. ★ Sustained, maximum power because of vastly increased fin area. Runs faster, longer—cooler! ★ Perpetually self-adjusting TIMER functions perfectly at all speeds. No wasteful power drag. ★ CircATOMic exhaust ports—circle the everlasting steel cylinder—for lightning fast ejection of burnt gas residue. ★ Unique HUBSHAFT cushions difficult landings and reduces bent or broken crankshafts to irreducible minimum. ★ Transparent, streamlined plastic gas tank fitted with the ingenious SWIVELTOP, automatic refueler.

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If you take your flying seriously, give yourself a new start, choose a FORSTER "29" to help you to the top. You cannot buy a better motor at any price.



"B" Class—1 1/5 h.p. at 7200 R.P.M.

The "29" is especially adapted for inversion. No extras to buy, no bearing trouble! Ask for folder "B."

PRICE \$18.75 COMPLETE
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You fellows, flying with FORSTER motors, would you like decals for your plane, "Powered by FORSTER"? Write us, enclosing 3c stamp.

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1415 LAKE ST. MELROSE PARK, ILL.

this article; it will make us feel the Aërbo had proved a swell flier for boys all over the country, as well as locally. Any such records we would appreciate hearing about.

Aërbo The Thermal Thief

1st. Place Easton, Pa. Time 14' 32"
1st. Place 1939 Nationals. Time 3' 34"
1st Place 1941 Nationals Time 11' 05"
1st Place Reading, Pa. Time 10' 12" (Two Official Flights) *
3rd Place Philadelphia Invitation Meet Time 6' 34"
3rd Place Broomall, Pa., Time 4' 12" (One Official Flight)
3rd Place Lancaster, Pa. Time 11' 14"

The Fuselage

The fuselage is extremely simple to build because, while the crutch is on the board drying, construction of the upper part can continue. The first step is to lay the crutch down, using the measurement indicated in the specifications chart. The wood used is medium 1/4" squared except where noted on the plans. Having completed the crutch, the pylon should be cut out of 3/16" ply balsa, notched at the places indicated on the plans. Having this job completed the pylon should be glued in, taking extra pains to see it is perpendicular to the crutch.

With the pylon securely mounted the next step is to put in the triangular cross braces. piece of 1/16" x 3/16" is glued from Station G to the elevator station, (refer to perspective drawings for clearer explanation) using 1/8" square cross brace. Continue to add top braces till they are all filled in. Let the fuselage thoroughly dry before removing; this will prevent it from warping out of shape.

Remove the product up to this point and add the lower part. Proceed as follows: and a strip of balsa 1/8" square, allowing enough over for bend. At Stations A, D, H and T glue cross braces using the proper measurement in the specifications chart. Continue adding cross braces till the fuselage looks like perspective view No. 3.

Next add the tail skid, numbered R-I on plans, streamlining it as much as possible. Completing this operation, now concentrate on the front. Cut out plywood formers, the firewall and filling at station B. Form the landing gear and attach to firewall before gluing in place. Cut the motor mounts of maple measuring 5/16" x 7/16" and glue in place, sparing not glue. Before continuing work on the fuselage, make sure motor bearers are perfectly straight with no offset whatsoever. Add the elevator saddle next, lining it up as nearly perfect as possible. Make the pylon. The wing rest should be added, taking the same precautions as with the tail saddle. Having this completed, put in the wiring system.

The battery box is now made; refer to the plans for details. The coil should be well braced in the fuselage to prevent knocking out by sharp jolts. Put the battery box and timer on the right-hand side for the best launching position and solder all connections thoroughly for best results. Having the wiring in, plank the front from A to B with 1/16" balsa; also plank from P to T to prevent the tail from snapping off through some mishap. These tasks completed, "clean up" the body by adding gussets under the

motor mounts, sanding the entire body with fine sandpaper between each coat of dope. Add wing hooks and put on 2" rubber or balsa wheels.

Control Surfaces

The wing being the largest job of the control surfaces, it will be first constructed. The wing is made in five units: center section, two first dihedral sections and two second dihedral sections. The first thing to do is draw a full size set of plans and lay the first dihedral section down, using rib No. 1 and the wood specified on the plans. The only caution used here is that the trailing should be notched to prevent rib warping. Allowing these two sections to dry thoroughly, the second dihedral section (wing tips) and center section are laid down. The only difficult part might be the wing tips so a little detail description may make it easier. First cut out the wing tip templates and pin them down in their proper position; pin the leading edge in position. The ribs are then put in with the spars attached and glued in place. In all instances do not glue the dihedral rib in place. Have all sections formed, the dihedral formation is next. The center section is first laid over its respective place on the plan, the next section, and the wing tips respectively. The spars are allowed to overlap each other about 1/2" to give plenty of surface for gluing. Plank two inches of the center section with 3/64" balsa. All construction points from there on are clearly indicated on the plans.

The elevator and tail are the next operations on the line; we'll take the elevator first. With full scale plans already drawn up, cut all elevator templates out; pin and glue in their respective places. Pin the leading edge down and glue to elevator templates already in place. The ribs are next; cut from 1/16" sheet. Then, proceeding in the construction, put in the bottom 1/8" x 1/4" spar. Plank the elevator center.

The rudder is simple to construct and effective in flight. The typical rib is shown on the plans, through the rib center a 1/16" spar tapering from 3/16" to 1/16" is glued. The leading edge is a piece of 1/8"; the rudder template is indicated full scale on the plans. Having it fully completed, the tapering spar, which is allowed to overlap the base rib, is notched in to the planking on the elevator. The main rib is glued on to this planking to give the rudder full support and prevent it from warping.

Covering

The Aërbo was covered with double rubber model Silkspan, with the Silkspan cross grained to give it double strength and lock the wing to prevent warping. All the surface is perfectly flat. The initial covering should be put on with cement and given two coats of dope before applying the second covering. The second covering is applied with plain dope, pulling out most of the wrinkles by hand. Cover the wing in sections to insure best results. Before applying the tissue on the wing, dope the gluing surfaces; such as the ribs, trailing and leading edges and wing tips.

Testing and Flying

All the Aërbo's which were built according to the original plans had a tendency to fly with little difficulty upon taking the air.

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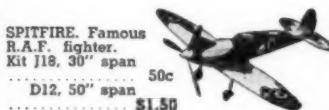
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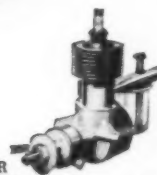
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LOCKHEED INTERCEPTOR. Novel design, called "Lightning" by the British. Kit J23, 30" span. 50c
GRUMMAN G36A. "Martlet." Shipboard fighter used by U. S. A. and Britain. Kit J24, 30" span. 50c
GRUMMAN "Skyrocket." American-made one-man fighter. Kit J25, 30" span. 50c
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This was of course with a few restrictions; the motor was going at a speed enabling the ship to get in the air for us to study its reactions. From that point the model is either a potential flier or a heap of balsa.

In order to make this stage a little easier for some of the less experienced, a few pointers will ease their strain. First, offset your motor about three degrees to the right (from the rear), but with no down thrust or up thrust, and the rudder about 1/8" to the right. More adjustments may be needed from this point but these make it easier to acquire peak performance. The ship should balance on the last wing spar and should weigh about 16 ounces.

Test the ship in tall grass; if it is nose heavy put positive incidence in the elevator; if tail heavy, put in negative incidence.

Our only hope from here on is after the ship has flown well and entered in contests, you still have it when next year rolls around. For, when next year rolls around, in the records forementioned in this article, your name will be added to this record and the Aero will be riding the thermal rails from East to West.

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Frontiers

(Continued from page 16)

At the present time the exhaust flame is playing havoc with a splotch of camouflage in the vicinity of the exhaust tailpipe. That is one of the little things that preliminary flight tests bring out; most manufacturers usually find that in their careful design the airflow around their engine nacelles has been too snug and the exhaust flame has wrinkled the structure to a disheartening degree. The tailpipes are located on the nacelles lower outboard side, out of the pilot's view, so that their glare will not annoy the crew. They, also, will not have the "cigarette lighter" effect on the gasoline stored in the wing, inboard of the nacelles.

Large three-bladed Hamilton Standard Hydromatic propellers are used; these are hydraulically operated and of the constant speed and full feathering type. On the most recent propeller governors, which are probably incorporated on the Ventura, the control valve is spring loaded so it will assume a position to give satisfactory operating pitch in case the propeller controls are shot away in combat. Thus the pilot will be able to fly the airplane back to its operating base. It is assumed that other like features are installed in the other engine controls of the Ventura, including, no doubt, self-sealing fuel tanks.

The most striking design change over the Hudson is the fuselage belly. At the aft end it raises abruptly to provide a gun pit much as does the Martin Baltimore or the B-19. The plane is said to be better armed than the Hudson. The only objectionable feature is the continued presence of the "posts" for the Fowler flaps projecting from the wing trailing edge. The "letter box" fixed slots at the wing tips are still employed.

Vega's new huge factory at Burbank, California, has been completed and production is now underway on the Ventura. It shall make an excellent bomber for the R.A.F. and should be able to match anything in Europe.

Another airplane that was completed recently, bearing a slight resemblance to the

Ventura and likewise still retaining the tail-wheel landing gear, is the Martin Baltimore. It is a smaller airplane, a development of the Martin Maryland which the French purchased and which the English and Germans confiscated and used to the best of their ability. Where the Maryland had a little over 2,000 hp. from two engines the Baltimore has over 3,200 hp. . . . a big jump. There being not much airplane and plenty of horsepower, the Baltimore gets right in line for bearing the title of the world's fastest bomber! With exception of the nose, the plane, which has made its test flights, has the same outside appearance as the Maryland, but the interior makes it a much improved war machine, including use of power gun turrets. The fuselage nose is completely plastic and more oblong and pointed than that of its round nosed predecessor. The pilot still sits low and snug between the two engines, and though visibility does not appear to be exceptionally good he is protected from a good portion of the gunfire. A crew of four is carried for reconnaissance flights as well as bombing expeditions into enemy territory. The engines used are 1600 hp., 14-cylinder Wrights.

Curtiss has done some redesigning of its pursuit series and is now well in the throes of production on the P-40D and a like model known as the Kittyhawk for the R.A.F. It is said to be faster than the original P-40 with 25% more fighting power. The new ship is not as trim an airplane as the prototype for everything from the windshield forward appears to have been dropped down a few inches. This no doubt was for the pilot's benefit, for when taxiing most pursuit ships the pilot must adopt a zig-zag course in order to see where he is going and miss all the fire extinguishers that were erroneously left out on the ramp. Bell has a good sales point in that its Airacobra has a nose wheel to maintain the airplane in level position so the pilot may have clear vision ahead. On our tail-wheel ships it is necessary for the pilot to take a look down the runway before he turns into position and for the first few seconds of the takeoff run there is a blind

spot straight ahead until the tail comes up. That is no fun when taking off a small field in formation!

A long, flat carburetor air scoop remains on top of the engine cowl but the two machine guns have been removed. Where they have been placed is not obvious. Apparently the later F3R Allison replaces the much longer Allison with its gear box in front, as the nose of the Kittyhawk has been shortened an appreciable amount. With the propeller spinner closer to the engine a larger opening is provided for air intake to the two Prestone coolers and the oil temperature regulator. Flaps are provided at the air intake scoop's trailing edge to control the temperatures of the oil and coolant at the same time. This may be done with only one control as the oil and coolant temperatures vary proportionately. Outside of the engine installation, the rest of the airplane appears to be unchanged.

And still another new airplane to take the air for Great Britain is Bell Aircraft's Caribou. The biggest difference in this plane from the prototype, the Airacobra, is the redesigned vertical tail surfaces. We personally always thought Bell put out the best rudder designs "of the bunch" as far as appearance goes; however, appearance does not mean much in the design of a vertical tail surface as the one that usually wins out is something not as pleasing to the eye. This is the case of the new Caribou's. Otherwise the airplane has all the Bell P-39s features now seeing extensive service in the U. S. Army Air Corps. The Caribou, like all other planes for the R.A.F., looks exceedingly warlike in its coat of camouflage; the belly and lower wing surfaces are light gray, the remainder is in two tones of brown; the bottom light to hide it in the air and the top dark to hide it on the ground. And when looking at the airplane from the side you still wonder whether it is porpoise or alligator.

We have still another "bundle for Britain," the Vultee Vengeance. It has undergone all its major test flights and donned its war paint in preparation for scaring the Germans. There are probably two reasons why the Germans will be scared; one is its dive-bombing ability will make the boat captain below wish he had become a flying-boat pilot and . . . well the airplane is not very pleasing to look at in any weather; its lines are anything but what might be expected of a modern dive bomber. Starting with the nose we see a big Wright Cyclone double-row that has enough horsepower to split the air no matter what trails along behind it. It has one of those oblong cowls with the carburetor air intake at the bottom and within the cowl structure. This provides exceedingly clean streamlining, and the fuselage follows this contour, with same cross-section, clear back past the rear cockpit where it abruptly begins to taper. This gives the fuselage the appearance of a bump in the belly at the tapering point which might easily have been avoided. The reason, however, for continuing the same cross-section so far aft is to provide area in the bomb bay for all the bombs, for they are all enclosed in the belly on the Vengeance. In this way, when the plane dives, the enemy thinks he is just in for some machine gun spray until suddenly a bomb is dumped in his lap as the big surprise.

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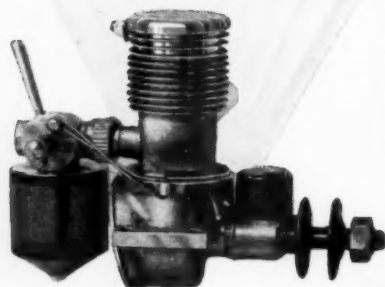
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The pilot and co-pilot sit in tandem in an enclosure, much the same as on Vultee trainers. Going further aft we come to the tail which is much on the British Skua style with vertical tail surfaces well forward so they will not be blanketed by the horizontal surfaces in a spin. From the appearance standpoint only, we cannot see how such a long square fin and rudder, pointing many feet skyward, will stay with the airplane during a high speed dive.

The wing is distinctly of the mid-wing type with the center section extending out about one third the wingspread. From there the tapered outer panels take on considerable dihedral. The tips are stub as are the tail surfaces, marking the evolution of another plane over to that enigma. We notice that the streamlined Spitfires are now haunted with square tips and the Messerschmitt Me109, that started all this "chopped off" business, now has nicely rounded, knife-sharp, wing tips! It is a thin, high aspect ratio wing on the Vengeance and does not provide much room for the retractable landing gear that swings back, swiveling at the same time (as on the Curtiss P-40) into the wing center section. Thus a considerable amount of fairing protrudes from underneath the wing for housing the landing gear struts. In conclusion we fail to see the merits of this design over other recently completed dive bombers, but perhaps there are features, not seen with the naked eye, that are kept from us. Northrop Aircraft Inc. will also build the Vengeance.

We heard that Harlow needed some landing gear legs for its new little trainer, and rather than go to the expense of designing a new pair, a pair as used on the Vultee was installed. Even though the Harlow is a very light plane, being a trainer, it will get its baptism of hard landings and such large landing gear legs may be needed. In other words the student is now insulted before he even gets in the airplane.

Despite the fact that England, Russia, China, Turkey and practically every other country that would like to get Hitler on the bottom side of a pile driver is clamoring for American built warplanes, we are still endeavoring to save some for our own use to see what we can whip up in the way of a cozy little air force. As we mentioned before, the aircraft production lines are just dribbling, and the dribbling may not end until the first of the year. In the middle of 1942 we will first see what real airplane mass production is like, but in the meantime we are of the opinion that the U. S. Air Corps will have to relinquish more airplanes to Europe than it had counted on. At this moment there are easily a thousand modern warplanes grounded on our fields awaiting some little item to complete their equipment before they may be shipped overseas. If these airplanes had been sent to Russia immediately, they may have been enough to change the whole story there.

However, with Curtiss in the throes of its P-40D, it has a P-40E on the stove and has already test flown a new super P-46 pursuit for the U. S. Army Air Corps. It is very likely that bombers the size of the B-19 may be put into production by at least three different manufacturers. The first may carry the designation, B-29!

That's all till next month!

A Miniature Flying Skyfarer

(Continued from page 27)

long flights—stretch the rubber strands about 2-1/2 times normal length and store up power.

Now that your Skyfarer is completed we are sure you will be more than pleased with its performance. Our original ship proved to be a consistent and capable flyer; it is exceedingly fast in climbing and gains considerable altitude for a ship of its size. The glide is flat and covers surprising distances from high altitudes to come in for easy, realistic landings on the tricycle gear. Happy landings!

Gas Lines

(Continued from page 21)

demonstration and a neat bit of smoke screening. These were all in the miniature and helped put on a fine show.

Jim Anderson, age seventeen, captured first place and the state championship. Bruce Campbell came in second with but a few seconds difference in time.

Clubs and fliers from all over the state had their representatives and all were more than pleased with the way the contest was handled. We wish to add here that the famous cowboy flier (Cowboy Wenrich) took ninth place.

Loud speakers were installed in different parts of the field so that the spectators knew just what was taking place during the event. The contest was not without its usual crackups and "close shaves," affording laughs for the spectators and sorrows for the fliers.

Picture No. 3 shows Leonard Wolf and Robert Prajen, who won first and second places respectively in the Tampa Air Cadets Scale Model Contest. The ships were built in exceptional detail and displayed workmanship worthy of old hands.

Lately many gas model builders have been turning from the "commonplace" contest planes and are building scale gas models. One of the finest examples of this type of ship, shown in picture No. 4, typifies the ideal of thousands of model builders: To build a model plane that looks exactly like a big ship and will fly consistently. It is constructed by G. V. Weeks of 2119 E. Jarvis Street, Milwaukee, and is a model of the Douglas 046-A built to a scale of 2 in. equals 1 ft. The 4-1/2 in. wheels are the only parts not to scale; these should be slightly larger. The span is 92 in. and embodies details such as radio antennas from wing tips to rudder and loop underneath, air scoop, oil radiator, landing lights (not wires), machine gun in wing, pilot tube and dummy radio box between cockpits.

The fuselage is planed with 1/8" balsa covered with bamboo paper. The cowl face is spun aluminum; landing gear is of 1/8" wire streamlined with sheet aluminum. The tail wheel is sponge rubber and full-swiveling. Bamboo paper is used throughout for covering; the whole ship being painted with Berryloid dope in standard Army colors and insignia. The ship weighs 7 lb., is powered with a Brown B67, which is still running.

Apropos of the comments in the first part of this article, concerning training

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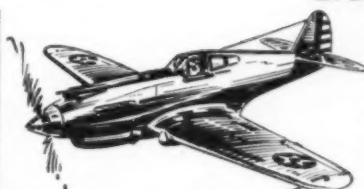
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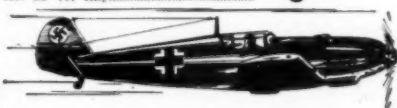
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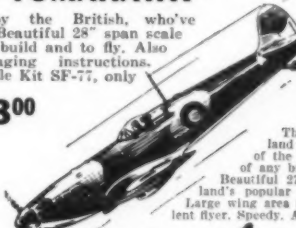
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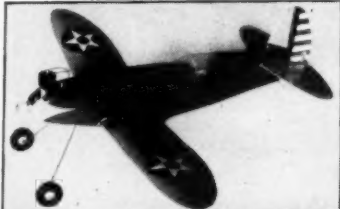
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New Rubber Power Kit Two Gas Power Kits
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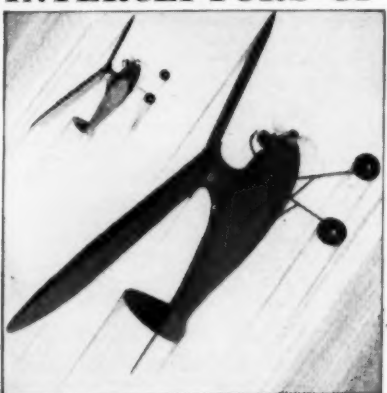
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young men in Russia by means of models, we present picture 5, showing contestants at one of the meets in Russia. It is interesting to note the different types of gas models used.

Every year Florida holds a state model airplane contest; this year at Daytona Beach. Though this meet was held some time ago, it has been impossible to print news of it, due to national contest activities. However, belated, it is interesting. Bill Ramsey, home town boy, won the major prizes by amassing 500 points. For this he was awarded a free flight by Eastern Air Lines to the Nationals in Chicago. In picture 6 you see him at the right. Second from right is W. D. Hoffmann of Sanford, winner of Class C; at the left is W. T. Thomas, A.M.A. contest director for Florida. The meet was a huge success; 69 boys, men and women participated. There was an estimated 2,500 spectators.

Picture 7 shows an interesting moment for one of the contestants; here is a super-design model about to take off, launched by Billy Thomas, son of Mr. W. T. Thomas.

There comes a time in every model builder's life when he is possessed with the desire to build a flying miniature of some large plane, not merely a scale model but one with all the structural details and "doodads"; a plane that looks exactly like the real thing, gas engine and swinging scale props. Such a plane doesn't completely thrill the builder unless it is of fairly large size.

Private Charles E. Englerth of 7th Sch. Sqdn., "C" Flight No. 369, Chanute Field, Rantoul, Ill., is one who experienced this urge about a year and a half ago; consequently he decided to build a 9 ft. miniature of the DC-3 Douglas transport. After about a year's work the plane took the air and made many successful flights.

The ship is shown in picture 8 in the course of construction. Complete, it weighs a little over 10 lb. The covering is 1/32" flat balsa, which in turn is covered with .03 aluminum foil, which cost approximately \$150. Two Brown engines, running in opposite directions, were installed. In order that they might be completely cowed, the centerline of the shaft was dropped below the center of the cowl, gears being used to drive the propellers. The torque of each propeller is balanced by the propellers spinning in opposite directions. This makes a "sweet" flying airplane and one less liable to spiral diving and spinning.

Mr. Englerth says that during the flights there were, of course, a number of minor crackups which always must be expected, and which only can be remedied through experimentation, for which purpose the plane was primarily built.

This is one of the finest model jobs we have ever seen. Mr. Englerth is now an airplane mechanic with the Army and has recently started plans for an all-metal radio control Bw11 Airacobra model.

Picture 9 shows winners of the Queens, N. Y., Meet held recently at Creedmore, N. Y. Left to right they are: Class A, Leon Shulman; Class B, Cliff Travis, who was also high time winner of the contest; Class C, George Gordon.

One of the finest flying radio planes that ever took the air was Jim Walker's at the 1941 Nationals. Before now we were unable to obtain a picture of Mr. Walker and his plane to insert in our stories on the Nationals; however, here is one, picture 10. The plane is of excellent design and very stable. At the contest one could readily imagine that there was a pilot in the ship, controlling it with the "stick." The motor would suddenly stop, then pick up again; a series of stops and starts were executed, giving the plane the appearance of "jumping over hurdles," for, under power it would rise, without power it would glide.

The one point about radio control which has bothered most fans has been the ground control. Mr. Walker worked out a simple model box; all that is required is to move the stick on the box the same as a pilot moves the stick in the cockpit. The plane responds accordingly.

The second annual Granite City Model Aero Meet was held August 3 at the St. Cloud Airport, Minn. The high time winner of the three classes of gas models was Mr. Bob Sweger of St. Paul, who won \$50 and a trophy with a flight average of 15 min. 45 sec. He also had the longest flight of the day with a time of 43 min. 32.8 sec. Winners in the two remaining classes, A & B, received Granite trophies and a motor. Picture 11 shows Bob Sweger with his model and helper.

Conrad B. Renning of Minneapolis won the Rubber Event with a time of 10. min. 10.7 sec., average flight; readers may remember that Renning was also winner at the Nationals. Many planes drifted out of sight because of high thermals which kept them at a considerable altitude. A short wave radio sending station on the field and a portable receiving set stationed downwind about 5 miles located the majority of lost ships; however, about 10 were not recovered. There was a total of 99 contestants. Flying started at 9:30 a.m. and lasted until 5.

One of the most outstanding model geniuses is Mr. Armand Vasquez. Armand doesn't go in for winning duration contests but rather for building beautiful planes that will perform like real ships and execute various maneuvers and functions of the large craft. He has been most successful at this and as yet never has failed to put on a good exhibition at contests which he has attended.

Picture 12 shows Vasquez with his most recent model; this includes a landing gear which retracts automatically, a flap which drops at the moment the engine gives out and other automatic devices. This is accomplished by a most unique and simple device within the ship, developed by Mr. Vasquez; no gears, stick work or anything of that nature is required and any number and types of maneuvers may be carried out provided the model is equipped with the proper control surfaces. Each maneuver is timed to take place at a given instant during the flight.

Picture 13 shows one of Vasquez' early models; this was flown at the All Eastern States Contest. The first official flight was the first flight the model ever made and yet it flew beautifully even in a

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strong wind and executed various maneuvers as predicted before the start of the flight. It zoomed several times, circled according to plan and then dove, releasing a bomb at the point of recovery. Finally the motor shut off, flaps dropped down and the model landed safely.

Without reservation we can say that Mr. Vasquez is the peer of pre-determined flight modelers.

Guam

Tethered or "G-Line" flying planes have become very popular lately. One of the first men in the country to develop and fly this type of ship is M. L. Sampson, MM 2/c of the U.S.S. Penguin, stationed at the U.S. Naval Station, Guam. He writes and says that he has been flying these planes for 5 years and has a number of patents on his model; this not only incorporates elevators but also includes aileron control. In 1936 an engine was added to the plane. For the control strings No. 8 white button thread was used.

Sampson says he has soloed in a big ship but he got the second "solo thrill" when he took off the little plane for the first time, with its Brown Junior engine running "wide open." He recommends this sport to would-be aviators as a means of preparing them for their big ship flight; in this way they can get the "feel" of the controls as the ship undertakes various maneuvers.

Ohio

The Flying Screwballs of Alliance, held their second annual model contest at Miller Airport. Flying was from 8 a.m. to 4 p.m. Palmer Fultz of Columbus took the honors of the day with a flight of 18 min. with his rubber powered job. Competition was for the three classes of gas planes and all rubber types combined. A two-way radio system helped retrieve the models and a public address system kept the crowd informed on the meet's progress. There was approximately 8,000 spectators and 175 entrants, 36 of whom received prizes.

Winners and respective times were: Class A-B, George Westmore of Cleveland, 5:38.6; Class C, John Hilligas of Cleveland, 4:30; Rubber Event, Palmer Fultz, 6:40.

Pennsylvania

Mr. Walter Beaumont of 8049 Ferndale St., Philadelphia, has been kind enough to send us the following news of the Philadelphia Council's Round Robin Meets:

"At the fifth round robin meet held at the Buselton's unit airfield, July 13, about fifty contestants turned out. This was due to the fact that Reading was holding a large meet on the same day. Mat Kania, Phila Gas Model Club, turned in several beautiful flights, losing his Class B on the last flight after staying in sight 7 min. 38 sec. W. Jacobs of the West Phila. Club, had the highest flight of the day, with a flight of 13 min. 59 sec.

The first four in each event are:

Class A	Club	Time
Joe Walker, P.G.M.A.		551 sec.

Erling Haabstead, Springfield	363 sec.
Ben Schaefer, P.G.M.A.	210 sec.
J. Schubert, Quaker City	170 sec.

Class B

Mat Kania, P.G.M.A.	1102 sec.
W. Jacobs, W.P. Club	970 sec.
W. Smith, Jr., Springfield	363 sec.
R. Beaumont, Quaker City	299 sec.

Class C

M. Nemroski, P.G.M.A.	331 sec.
Pat. Viola, P.G.M.A.	310 sec.
Bert. P., P.G.M.A.	292 sec.
Nardi, P.G.M.A.	252 sec.

"The official standings are as follows:

Class A

Haabstead, Springfield	217 points
J. Walker, P.G.M.A.	142 points
W. Smith, Springfield	133 points
H. Cornelius, Roxborough	101 points
M. Kania, P.G.M.A.	100 points

Class B

Mat. Kania, P.G.M.A.	334 points
Ray Beaumont, Quaker City	251 points
J. McBride, Springfield	234 points
A. Adler, P.G.M.A.	167 points
W. Bimder, Quaker City	151 points

Class C

Nemroski, P.G.M.A.	268 points
J. Bulredin, P.G.M.A.	231 points
Fedo Nardi, P.G.M.A.	177 points
E. Genis, W. P.	144 points
P. Viola, P.G.M.A.	100 points

New Jersey

Michael Gural, a 16-year-old model builder of Newark, captured the senior title in the annual New Jersey model airplane championship, sponsored by the Linden Model Aircraft Club, held on July 27 at the former Cranford Airport. Gural scored forty points, nosing out Silveo Colletti, of the local club, who also scored forty points. Each scored one first and one third place, but failed to place among the first ten in the third event. Gural, however, was awarded the title because he finished thirteenth in the third event, while Colletti was nineteenth.

Colletti, however, had the consolation of having established a new National record in the open Class D fuselage events with a total time of 29 min. 26-1/5 sec. The old record was held by Herbert Lisiecki, of Cleveland, Ohio. The Linden plane had a flight of 26 min. 27-1/5 sec. the second try, but it flew out of sight and was not recovered.

A record entry of 101 contestants found the weather ideal for flying their miniature planes and produced many outstanding flights, including the National record. The Linden Recreation Commission was a co-sponsor of the meet.

John Best, 15 years old, of Elmont, N.Y., won the junior championship, placing first in the fuselage event and third in the glider test, for a total of forty points. Donald O'Connell, of Iselin, was second, with thirty-seven points. He won first place in the glider event and fourth place for fuselage models.

Bud Van Wyk, defending senior champion, placed in only one event, while Saul Levinson, the 1940 junior title holder, had to compete in the senior division this year,

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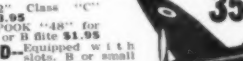
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UNCONDITIONALLY GUARANTEED**

Class "C" 1/5 H.P.—Complete with Coil & Condenser

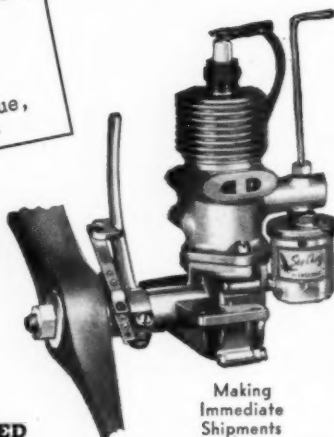
*Sky Chief "Lightning" 3 ounce Coil
*Bore $\frac{7}{8}$ ", stroke $\frac{1}{8}$ ", displacement .526
*R. P. M. up to 13,000 with 13" propeller.
*All bearings are Diamond-bored and Micro-lapped
*Weights approximately 10 ounces with coil and condenser

*Multiple-finned Cylinder made of Molybdenum Iron
*Piston centerless-ground and Micro-lapped with **PERFECT CIRCLE** Piston Ring for longer motor life
*Heat-treated Crankshaft made of polished-ground steel scientifically balanced.

Not a kit—a completely assembled motor ready to run.

American Supercraft Corporation

Union and Lake Streets
Chicago, Illinois, U.S.A.



Making
Immediate
Shipments

of
**Sky Chief's
Superiority!**

Best, Elmont, N.Y., 2 min. 6-2/5 sec.; fourth, Austin Rinaldi, Jersey City, 1 min. 38-1/5 sec.; fifth, Jack Beckley, Avenel, 1 min. 37-2/5 sec.

Superintendent of Recreation Frank M. Krysiak was the contest director.

New York

Over 100 contestants participated in the gas model contest sponsored by Jackson's Models and Supplies on August 3, 1941. Weather conditions were perfect with the exception of water on the field due to the previous week of rain. Many of the ships were saved from fatal crackups because of high grass.

The highlight of the contest was the flight Armand Vasquez's ship made on its maiden flight. The ship climbed to over 1,000 ft.; when its wing flaps were extended it kept climbing to an out of sight flight, much to his sorrow.

The contest director, Mr. Arthur Hasselbach, known as "Artie" to most of the boys, wishes to thank each and every contestant and also the many contributors, for the kind cooperation they gave to make this contest a success.

Following is a list of winners (time is total of three flights):

Class A

C. Travis	340 sec.
J. Kebba	245 sec.
J. Sammer	208 sec.
E. Miller	200 sec.
J. Bessar	188 sec.
J. Mays	187 sec.
M. Hegarty	175 sec.
B. Winterbottom	165 sec.

Class C

R. Willard (one flight)	700 sec.
G. Gordon	360 sec.
E. Poplawski	320 sec.
A. Marchant	173 sec.
J. Horton	140 sec.
J. Arribi	110 sec.
E. Janov	73 sec.
P. Ackerman	61 sec.

Class B

C. Hauff	290 sec.
C. Hermes	253 sec.
L. Bellotti	222 sec.
W. Voightlander	195 sec.
J. Ramsey	192 sec.
E. Nestor	180 sec.
D. Willard	176 sec.
A. Johnson	164 sec.

Stunt Event, Open

J. Hopkins
J. Kebba
J. Hegarty

Surprise Event (lowest time total)

W. Yuppa	151 sec.
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New York

The fourth annual New York-Pennsylvania model airplane meet, recently held at the Big Flats Airport, Corning, N. Y., was witnessed by 4,000. Strong thermals carried away many planes. The contest was sponsored by the Kiwanis and Corning Aero Clubs. One hundred and twenty-five planes were entered and modelers from all sections of New York and northern Pennsylvania won their share of awards, valued at over \$150. Maltby

and failed to place in any of the events.

The Linden Rotary Club Trophy and the Recreation Commission Trophy were awarded to the senior and junior champs respectively.

Results and the time for three flights are listed as follows:

Senior fuselage event—First, Silveo Colletti, Linden, 29 min. 26-1/5 sec.; second, Fred Dubin, Philadelphia, 19 min. 27-3/5 sec.; third, Michael Gural, Newark, 17 min. 5-4/5 sec.; fourth, Robert White, Bayonne, 16 min. 11 sec.; fifth, Bud Van Wyk, Haledon, 15 min. 4-1/5 sec. Senior stick event—First, Michael Gural, Newark, 16 min. 50 sec.; second, Emil Poljevka, Philadelphia, 16 min. 44 sec.; third, Raymond Dietz, Baltimore, 13 min. 34-3/5 sec.; fourth, Roy Beaumont, Philadelphia,

12 min. 31-3/5 sec.; fifth, Frank Ehling, Jersey City, 12 min. 3-4/5 sec. Senior glider event—First, Robert Dagond, New York City, 7 min. 47 sec.; second, Frank Ehling, Jersey City, 5 min. 19-3/5 sec.; third, Silveo Colletti, Linden, 4 min. 22-4/5 sec.; fourth, Edward Tripka, Linden, 2 min. 5-4/5 sec.; fifth, Francis McElwee, Linden, 2 min. 5-2/4 sec.

Junior fuselage event—First, John Best, Elmont, N.Y., 5 min. 1-1/5 sec.; second, Walter Merrill, Cranford, 4 min. 1/5 sec.; third, William Grove, East Paterson, 3 min. 42-1/5 sec.; fourth, Donald O'Connell, Iselin, 3 min. 30 sec.; fifth, Roy O'Connell, Iselin, 3 min. 19 sec. Junior glider event—First, Donald O'Connell, Iselin, 2 min. 48-3/5 sec.; Elmore Hoffman, of Phila., 2 min. 23 sec.; third, John

Nixon of Corning won the Kiwanis Trophy for making the best flying record of any Crystal City entrant, and placed in four of the events.

NOTICES

Recently we received a letter from Tan Tek Hok, 54 Plaboenweg, Soekaboemi, Java, D.E.I., who is most anxious to correspond with model builders in the United States. We hope some of them will respond to Mr. Hok's appeal; we feel he has some interesting news concerning activities in Java.

Mr. M. J. Thomas of 246 Morrison Drive, Pittsburgh, Pa., has received a letter from Mr. J. Remain, 24 Rawlinson Road, Old Swan, Liverpool 13, England, who wishes to find a "pen pal." He says he corresponds with modelers all over the countries, except America, and wishes to hear from a number of American model builders. In part, Mr. Remain writes: "I do not go to the movies on account of air raids, which we get very often, for it is not safe. These raids last from 8 to 10 hours and the time passes more quickly when you have something to do; writing to friends is a help." Mr. Remain is 17 years old and will be glad to hear from young men or women model builders.

Another English lad who wishes to correspond with American model builders is R. E. Gardiner of 56 Kirkland Rd., Spring Bank West, Hull, E. Yorkshire. He says American model books are scarce in England so he would like to get the news from some of the builders themselves, and exchange views and magazines with them.

Kenneth Wickenhauser of 3762 Aberdeen Avenue, Alton, Illinois also wishes to exchange views with a number of builders, preferably "old timers," for he says he has been building planes for just a short time and would like to have some of his difficulties straightened out.

John D. Graves of 46 White Street, Hartford, Conn., sends out a call to model builders who attended the Nationals:

"While at the Nationals, on the evening of July 2nd, in the workshop at the Hotel Sherman, I borrowed a small double-end socket wrench. It would fit a Champion U-3 sparkplug. Before I could return it to its owner he left. At the time, he was working on his all yellow 'Sailplane' gas job powered by, I believe, an Ohlsson '60.'

"I would like very much to return this to the rightful owner, so if this young man reads this notice would he please get in touch with me?"

Mr. Jacques Houser of 55 Semmes Avenue, Mobile, Ala., has just been appointed A.M.A. Contest Director of Alabama and he would like to have all model builders in Alabama drop him a postcard with their name, address and club affiliation as he would like to organize the modelers and put Alabama "on the map" in model activities.

Frank T. Moss of 1867 Flatbush Ave., Brooklyn, N. Y., writes:

"A red and blue high-wing gas model was lost in the vicinity of Hicksville, Long Island, on July 20th. The name 'Lancer 54' appeared on the side of the model. It was powered by a Forster '29.' The motor number was 1129. Any information regarding this model will be greatly appreciated. A reward is offered for its return."



JOE OTT *America's* *Ace Model Airplane Designer* *Announces*

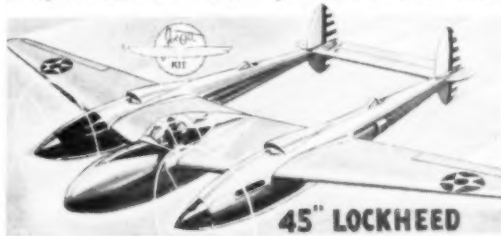
TWO NEW BATTLE PLANE FLYING KITS WITH SENSATIONAL OTT-O-FORMERS



45" SPITFIRE

SPITFIRE FIGHTER . . . 45 INCH . . . \$1.00

A superb model of the famous plane of the British R.A.F.



45" LOCKHEED

LOCKHEED INTERCEPTOR . . . 45 INCH . . . \$1.00

A breath taking model of this famous fast American ship.

New Time-Saving Method Makes Stronger, Light Ships—Quicker, Better

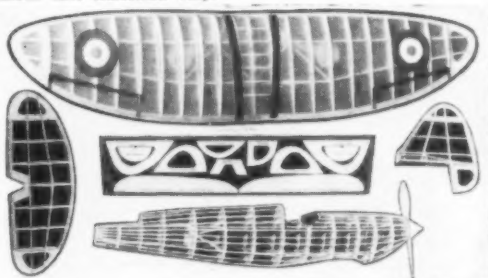
Cast your eye on these two beautiful fellows. Big, generous size models with full 45 inch wing span and made with the sensational new OTT-O-MATIC FORMERS. You can build these two ships in half the usual building time . . . one-fourth the usual assembling time . . . because all the advance preparation is done for you.

See them at your dealers or order direct and get the biggest thrill you ever enjoyed in model building and flying.

BEGINNERS. Get your start in the fascinating sport of Model Airplane building with the Joe Ott Model Building Course. See illustrations and description below.

Example of Ott-O-Matic Former Construction

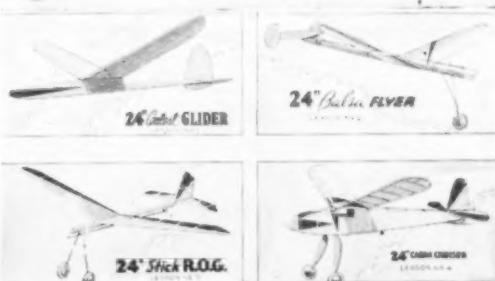
Here you see a Spitfire ready for easy and quick assembly. Making these parts is just as easy using wholly and partially die cut OTT-O-MATIC FORMERS. (Copyrighted and patent pending) Make your next plane from an OTT-O-MATIC FORMER KIT. You'll be surprised and pleased with the strong, light weight ships you can turn out.



Joe Ott's Own Model Building Course

Complete in four lessons, (\$1.00) each with a complete kit for building the plane shown. Starts with simple model. Advances step by step, many thousands already sold.

Four Lessons and Kit Combinations, Each 25c



SEE YOUR DEALER FIRST. Minimum mail orders \$1.00. Postage 25c extra. Dealers write. Jobber territory still open.



JOE OTT MANUFACTURING CO.
Incorporated
226 W. SHILLER ST. CHICAGO, ILL.

EITHER KNIFE WITH ONE BLADE 50¢

SETS in HANDY CASES \$1 \$2 \$3

WHEREVER YOU SEE THIS LITTLE MAN

the SHARPEST knives EVER MADE FOR MODEL MAKERS

BLADES EASIER TO CHANGE THAN IN SAFETY RAZORS

Extra Blades 10c Each

BLADES so sharp that the eye can't see the edge! And in a choice of 8 varied shapes (see below). Extra blades only 50c for packets of five. Instantly changeable, as pictures show.

Every model maker needs a set (\$1, \$2, \$3). See them at your dealer's... or send direct

X-ACTO-Crescent Products Co., Inc.

Dept. MA
440 Fourth Ave.,
New York



DEALERS!

Obtain real profits on gas and rubber powered supplies and kits. Send stamp for complete wholesale prices.

WATERBURY MODEL BUILDERS SUPPLY CO.
119 CHERRY ST., WATERBURY, CONN.

Flash News

(Continued from page 31)

to San Jacinto (California) non-stop flight of the huge ANT-25 monoplane which broke existing records.

Henry Ford will not wait for the completion of his huge \$47,000,000 aircraft factory at Ypsilanti, Michigan, to build Consolidated B-24D four-motored bombers. He states that he will build at least ten of the huge bombers in the old Ford airplane factory near Dearborn with equipment borrowed from Consolidated.

We believe that with this next item, FLASH NEWS offers its readers an amazing revelation: Donald Dunning, Los Angeles flier, who recently returned home after 15 months as a maintenance instructor on Lockheed Hudson bombers in England, had the opportunity of inspecting the Messerschmitt fighter in which Rudolph Hess, third ranking Nazi party leader landed in Scotland. "The tires of the plane bore the stamp of a United States manufacturer and the fuel tanks called for 100 octane, an American designation," he revealed. "In addition, a popular brand of American aviation oil was specified above the oil tank filler neck!"

Mexico has been extended credit for the purchase of war supplies, an order for 160 American-made military planes having already been placed.

A total of 54 persons were killed recently in three crashes, listing among the dead twenty Americans. The ships, all Consolidated "Liberator" four-motored heavy bombers, crashed in England, two at the take-off returning a large number of ferry pilots to Canada to pick up more planes, the third crashed in isolated mountain country after completing the non-stop flight across the Atlantic. The ships, in defense of the design, are equipped with the famed Davis wing and thus are extremely fast, difficult to handle at slow speeds and in general are "hot."

Forty more British youths have arrived in Los Angeles to enter flight training at Curtiss-Wright Technical school, bringing to a total of 150 such youths at the school. The boys, age 19 to 25, are under the command of Flight Leader T. T. Whitlock and will be trained for twenty weeks after which they will be returned to England for aerial gunnery practice and as-

signation to duty with Royal Air Force squadrons. Thunderbird Field, Glendale, Arizona, also has 150 such young men undergoing flight training.

Vega has completed plans for the construction, under the "B.V.D." (Boeing-Vega-Douglas) cooperative contract, of Boeing B-17D "Flying Fortresses" and the first such ship will get under way as soon as a new \$1,822,713 addition is completed. More than one hundred Vega engineers and technicians have been on duty at Boeing Aircraft in Seattle, familiarizing themselves with details of the giant ships' construction. It is believed that production on the bombers will not get under way until the middle of next year.

Artemus L. Gates, famed World War I flier, has been named assistant secretary of the Navy for Air. This post has been vacant for several years and only recently a similar position was filled in the War Department. Gates, it will be remembered, joined the Naval Aviation section in 1917 and served with the Northern Bombardment Group, cooperating with the French and British bombing objectives along the German and German-held coastline. He was later placed in command of a Naval Aviation unit at Dunkerque and while there he led in the rescue of a British plane which had plunged into the sea for which he received the American D.S.M. and the British D.F.C. He is a key man for a key position.

Major General George H. Brett, Chief of the Air Corps, is now leading a party of Army Air Force officers on a tour of African, Near East, Mediterranean and Atlantic war fronts in an effort to ascertain what methods should be taken to speed delivery of American warplanes. Also in the group of nine will be Major James H. Doolittle, who certainly needs no introduction to readers of this or any other aviation column.

The nation's oldest north-to-south airline, now only a chain in a vast system of one of the world's largest airlines, recently celebrated its 15th Anniversary with appropriate ceremonies in Los Angeles. Known now as United Air Lines Division 11, the company was originated under the name of Pacific Air Transport and it started flying the mail on September 15, 1926. The original equipment included six Ryan open-cockpit high-wing monoplanes, six hard-bitten ex-World War "Jennie" barnstorming pilots, a meteorological system consisting of friendly farmers who squinted at the sky, spat a stream of tobacco juice and said: "Nope, it ain't gonna rain tonight!", airport marker beacons consisting of old Ford Model T head-lamps and passenger accommodations provided by a rough ride sitting atop a mail sack in the front cockpit. The planes made the trip from Los Angeles to Seattle (1,100 miles) in 12 to 15 hours depending on conditions. Today huge Douglas Mainliners make it in 7 hours and 27 minutes regardless of conditions!

Two test air forces, the first of Uncle Sam's new and growing air might, are preparing to find out just how good our new Air Army is. Under the command of Major General Herbert A. Dargue, com-

REAL PLANES IN MINIATURE

KEEP IN STEP WITH MODERN AVIATION—BUILD METAL COVERED MODELS

Announcing the addition of three new models, The Grumman F4F-3, Spartan "Executive," and Republic Guardsman.



Actual photograph of Vultee Vanguard Model

DEALERS: Your customers will be asking for these kits. Write today for prices on your letterhead. Be prepared for the demand.

It is easy and fascinating to build real planes in miniature with sheet aluminum covering. Imagine these models, completely covered with aluminum even to reproducing the rivets in the actual planes. The photograph will give you an idea of how the finished model will look.

The kits contain all balsa parts cut to outline shape, die-cast propellers, rubber military type wheels, aluminum tubing for landing gear, celluloid windows, finest super detail plans, aluminum sections ready to apply. Nothing missing to build a real plane in miniature, with the exception of liquids.

SELECTION OF NINE MODELS
21" BOEING STRATOLINER \$4.00
(Postpaid) \$4.50
(This kit is absolutely complete, including motor, aluminum cowling, horns, etc.)
13 1/2" Republic Guardsman \$2.50
13 1/2" Vultee Vanguard 48A 2.00
13 1/2" Curtiss Hawk 75A 2.00
12" Spartan "Executive" 1.50
12" Consolidated PB2A 1.00
9 1/2" Grumman F4F-375
10" Bell P39 Airacobra75
9" Northrop BT A50
If your dealer can't supply you, order direct and include 20c postage with \$2.50 kits, 15c postage with \$2.00 and \$1.50 kits, and 10c with other kits. No C.O.D.'s. No stamps. Cash at your own risk. Send 3c for illustrated descriptive folders.

C Z MODEL AIRPLANE CO.
Dept. M, 3658 W. 65th St., Chicago, Ill.

A REAL GASOLINE ENGINE \$5.95



Here is your opportunity to buy a kit of the famous G.H.Q. Gasoline Motor. **ABSOLUTELY COMPLETE—ALL MACHINING DONE—READY TO ASSEMBLE.** All you need is a screwdriver. No mechanical knowledge required.

A large bore, 1/5 H.P., engine at a lower price than any small bore engine. Complete with Coil and Condenser.

ONLY \$5.95

AN ENGINEERING TRIUMPH . . . Never Before at So Low a Price!!

Indeed an engineering triumph—accomplished by outstanding G.H.Q. designers and engineers, who have constructed into the G.H.Q. motor everything that years of exhaustive scientific aerodynamic research could produce—geared to the highest possible degree of perfection. But more than that, the acid test . . . an overwhelming response. Thousands of users in all parts of the country are praising, recommending, and endorsing this scientific achievement. It seems as if everyone in America wants one. The most hair-raising thrill you've ever experienced will be yours with the G.H.Q. motor—actually one of the most powerful motors ever constructed. Has broken records for amazing performance.

ABSOLUTELY COMPLETE
Everything is in the kit including Champion spark plug, COIL, CONDENSER, tank and cap, ignition wire, cylinder, piston, connecting rod, liner, crankshaft, all screws, bolts, simple illustrated instructions, etc. Every part is fully machined and finished. A SCREWDRIVER IS THE ONLY TOOL YOU NEED.
EXACTLY THE SAME PARTS THAT GO INTO THE G.H.Q. ASSEMBLED ENGINE.

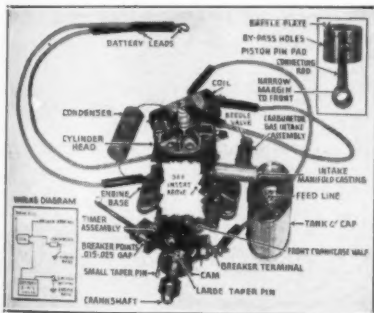
30 MINUTES TO ASSEMBLE ALL PARTS WARRANTED

Imagine operating your own G.H.Q. 1/5 Horse Power gasoline engine—small enough to fit in the palm of your hand—yet turning up over 7000 revolutions per minute and powerful enough to fly model airplanes of from 4 to 10 foot wingspan, and propel model boats from one to six feet in length and midjet cars that travel over fifty miles an hour!! There are also hundreds of other ways you can enjoy using this miniature yet powerful power plant—for small pumps, generators, compressors, blowers, fans, grinders and countless other experimental purposes.

Your G.H.Q. gasoline engine will be far more than just a toy for your spare moments. It is a scientifically constructed mechanical marvel that will thrill you with thousands of hours of pleasure. You will get a real kick out of controlling with your finger tip the surge of power your engine develops.

This engine has been tested and proven over the last eight years, OVER FIFTY THOUSAND OF THESE POWERFUL LITTLE G.H.Q. ENGINES ARE NOW IN ACTUAL DAILY USE. Why not join the ranks of these hobbyists?

ALL PARTS FINISHED & GUARANTEED



ENGINE IS COMPLETE and Ready to Assemble

Your engine comes to you with every part completely finished. Our factory-trained skilled mechanics, using the latest automatic precision machinery, have finished each and every part to the last detail. You merely assemble the parts in accordance with the few simple instructions given, using only an ordinary screwdriver, and inside of thirty minutes, your engine is ready to operate.

Not only will you and your friends have the thrill of seeing an engine ASSEMBLED BY YOURSELF operating, but you will gain a knowledge of gasoline engine theory and practice that will be of real practical value to you.

SPECIFICATIONS OF NEW 1942 MODEL

4 Port 2 Stroke Cycle. 1/5 Stroke. 15/16" Bore. 300-7,000 R.P.M. Bearing Surface, 1 1/2" Long. Crankshaft, 5/16" Diam. Rotation, Either Direction. May be run inverted. 1/5 Horsepower. Class C under NAA Rules.

DEALERS!

Get your share of G.H.Q. business! Write for new Discount Schedule.

This identical G.H.Q. Gasoline Engine Kit is also available in factory assembled, fully bench tested and ready-to-run form.

This comes to you already tuned up . . . ready to mount and run, complete with coil, condenser & wires.

G. H. Q. "Ready-to-run" Engine \$6.95

FREE

Send for free literature on G. H. Q. Gas Engines or send 5c for Jumbo Hobby Catalog and choice of free aviation or wings pin.

HOW TO ORDER:

Send Only \$1.00 Collect C.O.D. for balance. For shipments outside U.S. send full amount plus \$1.00 for packing, postage and insurance.

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MANUFACTURERS OF

Miniature Gasoline Engines and Model Airplanes
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The only nationally advertised \$5.95 kit that includes a coil, condenser and wires.

**Identical Engine
Less Coil &
Condenser**

\$ 4.95

G. H. Q.'s EIGHTH YEAR!

Thousands of Satisfied Users! Read some of these testimonials on file with us:

J. B., Providence, R.I.—"A few weeks ago I received the G.H.Q. motor kit and it is running perfectly. I hope to write you soon and tell you about some excellent flights."

R. H., Prairie du Chien, Wis.—"Your motors sure can take a lot of abuse and knocking around and yet perform perfectly. I have had two in a period of about two years and have seen higher priced motors give less service and performance."

W. W. W., Russellville, Ark.—"I received my G.H.Q. Motor Kit and am very well pleased."

W. L., Claysburg, Penn.—"A wonderful motor that thrills any air-minded person. Strong and neat looking. As good as motors costing twice as much."

A. K., Hillside, N.J.—"I still can't understand how you can put such a dependable and rugged engine on the market at such a low price."

E. T., Sayville, N.Y.—"Received my G.H.Q. Kit okay and am more than delighted with same. You've got 'em all beat for price and performance."

R. P., Hamburg, N.Y.—"I want to extend my personal thanks to G.H.Q. for their prompt service. The motor I ordered was received within 24 hours. Such service cannot be surpassed. I also want to say that I have the motor running perfectly. I shall do all I can to help promote the success of G.H.Q."

H. H., Midlothian, Ill.—"Motor assembled correctly and performs perfectly. I am fully satisfied."

**THE G. H. Q. GAS
ENGINE CAN BE
USED IN BOATS,
MIDGET CARS & PLANES
WITHOUT ANY CHANGES**

The G.H.Q. Gas Engine sold six years ago for \$35. Over 7000 were sold at \$8.50. Today, you can secure a vastly improved engine kit for only \$4.95 or \$5.95 or factory-assembled for only \$6.95. How is this possible? Simply because we have invested thousands of dollars in tools, jigs, dies and equipment to produce the only mass-production motor in the market. All parts are uniformly perfect.

**15,000 G. H. Q. ENGINES AND
KITS SOLD IN THE
LAST YEAR**

this
BURD MODEL
has stress-tested
balsa!

55" WINGSPAN



Chester Lanzo's RECORD-MAKING MODEL

This gigantic stick model is winning everywhere. A terrific flyer—easy to build. Super complete excepting rubber. Ask for Lanzo's Record Holder at your dealer's. Accept no substitutes. It's an unbeatable plane worth three times its price. **79¢**

BURD

MODEL AIRPLANE CO.
2113-2117 East Oliver St., Baltimore, Md.

mander of the First Air Force, Mitchell Field, New York, the 114 bombers and 196 pursuit planes will find out if our Air Force can cooperate with the huge Army under the command of Lieut. General Walter Krueger, in the Louisiana maneuvers as effectively as Hitler's Luftwaffe did with his ground troops in the past two years. New techniques have been developed from reports from the war fronts of Europe and the paper-work has been laid out in great detail. Now to see if it works!

In Washington recently a grey-haired man in rumpled white linen pants and coat stepped into a department store to

buy some trousers. The clerk displayed a pair of trousers which seemed to please the customer who stepped into a booth to try them on. Emerging in a few minutes he heard the clerk say, as two Navy men came in: "The Navy comes first, you know, national defense!" The clerk then waited on the sailors while the man in the linen suit waited with a patient smile. After a while the clerk returned as the sailors prepared to depart. "Will you charge these, the name is Towers," the man said. "Admiral John Towers, Chief of the Bureau of Aeronautics!"

Mrs. Jean Satterlee Lewis has become the first woman in the United States to

work as an airline meteorologist. T.W.A. has hired Mrs. Lewis as a junior meteorologist after her graduation with a Master's Degree from the University of California, a Phi Beta Kappa. A few weeks ago she qualified with a grade of 97.86 in a U. S. Weather Bureau civil service examination but chose the airline instead.

The Manta! Remember that name, for the new Manta fighter should break all existing speed records within the next year. Designed by Richard E. Davis, of Davis-wing fame, the new fighter is bigger by far than most fighting-type ships but a speed of 500 miles per hour has been designed for.

Consolidated Aircraft Corporation of San Diego, California, will soon be the largest in the entire world. It is of absolutely fantastic size, its present plant being the largest in America, and Plant No. 2 is now ready for occupancy almost doubling present facilities. Hiring is now at the rate of over one thousand weekly.

The aircraft manufacturers are now paying \$8,516,768 EVERY WEEK to 232-233 workers! Both figures rise daily.

Allison liquid-cooled engines are now developing 1,325 horsepower at a gross weight of 1,303 pounds!

A Lockheed Hudson bomber recently dropped bombs on enemy objectives exactly ONE WEEK after its completion at the Burbank (Los Angeles) plant.

A new coffee bean plastic known as "Cafelite" may soon go into wing structures of American warplanes. Thousands of tons of Brazilian coffee may thus become of great value after all.

Strangest case of "Sabotage" reported to date is that of Whitney Wilhemy, who recently filed off the rivet heads of a portion of a Lockheed interceptor and informed his superior of the work of saboteurs in the hope of gaining promotion for alertness!

*** AMERICA FIRST IN THE AIR ***

The Springfield Trophy Winner

(Continued from page 19)

Test the balance and then bend a shaft out of .014 wire; cement it carefully and when dry attach two washers about 3/32" in diameter. Before flying always add a drop of oil to reduce friction.

Covering and Assembling: The model is covered with microfilm. Cover the wing by applying saliva to the framework, placing it upon a sheet of microfilm and trimming with a hot wire. 2.5" dihedral is required in each wing half. Make a firm cement joint.

The clips are cemented to the wing making allowances for 3/16" incidence. Stabilizer and rudder are covered in the same manner. Now cement rudder and stabilizer to the boom, making sure they are exactly perpendicular to each other. The tail boom is lined up and butt jointed directly to the rear of the motor stick. To remove wrinkles from any of the surfaces, hold such a portion a few inches above a hot soldering iron until the heat has tightened the film sufficiently to remove wrinkles and make a smooth surface without warping the model. This is also a good method to line up warped parts, if any.

Adjusting and Flying: Select the proper

SEE M & M'S New 25/8" Flyweight Gas Wheels 75¢
1/2 oz. PER PAIR PAIR PP.
3" Balloon Wheels \$1.00 PAIR PP.

Ask your dealer for our new free colored literature

Get That
Extra Protection
With **M & M**

All M & M Wheels can be inflated & deflated

Beware of Inferior Wheels built to look like M & M's

All sizes of M & M Wheels are the
Lightest and Best Wheels Made



M & M'S ARE STANDARD EQUIPMENT IN ALL LEADING KITS
M & M's New 25/8" WHEEL Designed for SMALL GAS MODELS ONLY \$0.90.

For Air Mail add 17¢.
M & M 3 3/4" Gas Wheels \$1.50 P.P. For Air Mail Add 21¢.
3 1/2" & 4 1/2" Gas Wheels—Now only \$2.75 per pair, postpaid.
6" Gas Wheels for Radio-controlled models \$4.50 Per Pair.

M & M MODEL WHEEL CO. 325 North 79th Street
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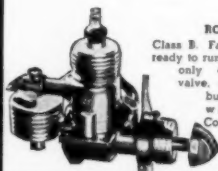
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length motor, 3/32" x 1/30" brown rubber. Carefully tie a knot that will not slip, attach the prop. Before attempting to glide or try a power flight, sight down the model from the front end and check for warps. If there are none, set the trailing edge of the right wing panel about 1/4" lower than the leading edge, to counteract torque; the left wing panel should be level. Twist the tail boom slightly so the stabilizer right half is about 1/2" lower than the left half, or enough so the motor torque will make the wing and stabilizer nearly parallel. Next set the left stabilizer half at a negative 1/8" and the right half at zero.

The model's center of gravity should be about 1 1/2" forward from the rear wing clip. Make sure the wing clips are fastened securely, then glide the model. If the ship stalls, move the wing back, decrease the incidence or both. If it dives, the opposite is in order. Repeat this treatment until proper glide is obtained. The model may now be wound for its initial test flight; four hundred turns on the rubber is sufficient. Launch the plane banked slightly to the right and held level. The plane should turn in circles of about 40 feet to the left and maintain its altitude for at least two complete circles.

Since this article was written, this model opened the 1941 indoor season with a victory, in the Senior—Open Class Stick Event, at the Chicago International Amphitheatre on Feb. 8, 1941.

So you see, this model seems to be a "sure-fire" winner. Best of luck!

Echoes of the 1941 Nationals

(Continued from page 23)

sending of Miss Ann Acker of Birmingham, Alabama at the banquet as Miss Model Aeronautics. Her time? 14 years! . . . the record display of cups and trophies which were two rows deep on the fifty foot long banquet table . . . the many fine cameras carried by the modelers and their assistants gave the appearance of a camera convention rather than a model meet . . . incidentally, if you have any outstanding photographs taken at this or other meets, remember to send glossy prints with complete captions to MODEL AIRPLANE NEWS . . . the old dodge, an indoor stick model converted to a cabin model by clipping a built-up section to the stick was eliminated this year for the first time by the new rules which were followed religiously by all and sundry . . . a huge 4 x 4 foot master contest book was utilized by officials and contained complete information on each contestant, including events entered and fees paid . . . Academy leader members played an important part in the success of the meet, lending a helping hand whenever asked and directing exclusively the radio control flying . . . the headquarters of MODEL AIRPLANE NEWS, room 1776, whose number stood for untrampled thought by the American aeromodeler, had to be changed this year to 1786, which put MAN about 10 years ahead of itself . . . the double-decker buses had a minimum of clearance underneath the trolley wires while en route to each day's contest, but although

plenty of shivers were reported no casualties resulted . . . the observations of the average contestant and spectator are always interesting and unfortunately too often neglected. If you have any comments on what you learned at the National Meet, why not drop us a note? We shall be glad to pass your comments on to other fliers.

Bomber Watchdog

(Continued from page 23)

"Can you do it?" he fairly shouted into the mouthpiece.

"It was just twenty-four years ago," White answered calmly, "that I received a telephone call almost exactly like this one. Our 'Brisfit' of the last War was the answer. What do you think, sir?"

"Call me when it's done, Stanley. I should like to be on hand for the first flight!" Newall exclaimed excitedly and replaced the receiver.

Knowing the time was short and that the very lives of hundreds of bomber pilots were at stake, Bristol engineers decided against the design of a new experimental type which might take months or even a year to perfect. Instead they turned towards the improvement of the most successful plane in the thirty-two year history of the firm. It all started in 1934 when a well-known British capitalist and air enthusiast sought the design of a fast, high-performance twin-engine transport plane for his own personal use. Willing to pay the price, he accepted delivery on the plane in 1935 and this Bristol transport, named "Britain First" was the fastest of its time. Later in the year, the Royal Air Force became interested in the design, suggested certain changes and early in 1936 large production orders for the Bristol "Blenheim" were being filled. In 1938 the "Short Nose Blenheim" was replaced by the "Long Nose Blenheim" or, more correctly, the Mark IV type. This type was in service at the time war was declared on September 3rd, 1939 and has done much valuable work particularly in the North African campaign. Late in that year a further development of the type was introduced for use with the Fleet Air Arm. This model, known as the "Beaufort," was a slightly larger and heavier version built around a heavy, four-gun turret on the aft upper deck. This ship, one of the most deadly developed, was chosen as the basic model for the new escort fighter. The crew was narrowed to two men, a pilot and a rear gunner. The equipment and installations were cut to a minimum in order that performance specifications could be met.

As the task of re-designing the "Beaufort" progressed, the design staff's enthusiasm mounted and with each new installation, this plane grew more and more unlike any ship previously used in war. Construction got under way and in just three and one-half months the first ship was complete and ready for test. Newall, Dowding and Portal were on hand as this new warcraft, named the "Beaufighter" took to the air for the first time. Far exceeding the generalized but tough specifications laid down by the Air Staff, the Beaufighter has done just what it was designed to do: cut down bomber losses. And now no longer do we read reports of dozens of R.A.F. bombers being

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lost in a single raid, as we did this Spring. And this is our Plane on the Cover for this month: the Bristol "Beaufighter."

The Beaufighter is a twin engine monoplane with single rudder and short nose which lies far aft of the engines, not unlike the highly publicized Grumman XF5F-1 Skyrocket. It has a fully retractable landing gear and tail wheel and is, by far, the most heavily armed plane yet produced in World War II.

FUSELAGE.—The fuselage is built in three sections, the forward part including the pilot's compartment and the nose armament, the central portion including the gunner and rear armament and the aft section carrying the tail units. Fuselage structure is basically conventional in that it is built up on a framework of vertical bulkheads and formers connected by open-channel section stringers riveted together with the aid of small clips. This structure is covered with Alclad skin riveted to flanges on the formers and stringers. The nose section bolts to the front wing spar and is short and blunt, its crosssection being almost square. The central section bolts to both the front and rear spars. The rear section bolts to this central section and the entire fuselage is thus easily assembled or disassembled for service. The entire upper nose section is open and there is a large opening in the upper portion of the central section to provide for the gunner.

WING.—The wing of the Beaufighter is also built in three sections, the center section supporting the fuselage and the huge engines and the two outer panels bolted to internal flanges. The wing is two spar de-

sign and tapers in both planform and thickness, particularly in the outer panels. The spars are a built-up structure consisting of two heavy, high-tensile flanges and a single steel plate between them. This web is reinforced by short, vertical stringers. The ribs are pressed flange aluminum alloy reinforced by riveted extrusions where required and are lightened by lipped holes. Stringers connect these ribs and the entire structure is covered with Alclad sheet riveted to the spar and rib flanges. The left outer panel carries a large landing light cut-out and both wings carry signal light cut-outs as well as provisions for armament installation. The ailerons are the famed Bristol-Frise mass-balanced type through use of lead weights bolted into that portion forward of the hinge line. The flaps, which extend between the ailerons completely across the fuselage and center section, are the split trailing edge type, built up on a structure of flanged ribs covered with Alclad. The ailerons are aluminum alloy constructed and fabric covered. A small trimming tab, adjustable on the ground, is carried on the trailing edge of each aileron.

TAIL SURFACES.—The tail surfaces are full cantilever, all-metal construction with the stabilizers bolted to the fuselage. These are constructed on a framework of ribs, stringers and Alclad covering. Rudder and elevators are fabric covered, statically and aerodynamically balanced by bolted lead weights. Both are equipped with trimming tabs, the elevators having two small automatic servo tabs. The rudder is controlled by the old-fashioned but dependable horn type fitted to carry the

HAWK 1/4" SOLIDS



KIT No. 13 B/J SEAPLANE

Kit contains body, rudder, elevator, and wings sawed to outline shape, die cast propeller, turned cowl where required, 2 bottles of paint, tube of cement, wheels and insignia.

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cables. The lower rudder portion carries streamlined sockets for both navigation and formation-keeping lights.

LANDING GEAR.—The landing gear is fully retractable and covered by two large retracting clam-shell doors. Each wheel is carried on two individual shock-absorbing struts and interconnected by cross members above the wheel. Retraction is accomplished by a Bristol hydraulic actuating cylinder which breaks the knee-jointed radius rods aft of the strut and pulls the entire assembly rearward and up into the wells provided in the nacelles. Retraction is by hydraulics with emergency operation by manual control. The landing gear system is adequately protected with safety precautions with both "up" and "down" safety latches, audio warning device and mechanical position indicator. The tail wheel is also fully retractable and works in unison with the main landing gear. Medium pressure tires are installed on all three wheels and each of the main landing gear wheels is provided with differentially controlled brakes.

PLANT POWER.—Power for the Beaufighter is provided by two Bristol "Hercules" III fourteen-cylinder double-row radial air-cooled engines. The Hercules is the famed and now perfected sleeve-valve type in which there are no valves, rocker arms or push-rods, only holes in the cylinders side which, when exposed by the passage of the piston inside, permits fuel-air mixture to enter and exhaust gases to exit as the case may be. The Hercules III has a bore of 5 3/4 inches and a stroke of 6 1/2 inches giving it a total displacement of

2,360 cubic inches, placing it in the same class with the Wright 14 "Double Cyclone" which develops 1600 horsepower. The Hercules III is geared .440 to 1 with the propeller and has the following power ratings: for takeoff at maximum r.p.m.: 1,290 horsepower; rated at rated r.p.m.: 1,150 horsepower; maximum power at 2,750 r.p.m. at 4,000 feet: 1,375 horsepower. The powerplant of the Beaufighter is of the self-contained Bristol "power-egg" type in which the entire powerplant, consisting of engine, carburetor, magnetos, starter, oil cooler fuel pump, hydraulic pump and vacuum pump, is removable in a single unit by detaching four bolts securing the engine mount to the plane. The firewall is located forward of the engine-mount support tubes, as distinguished from standard American practice. The oil coolers are the honeycomb type, located in each outer wing panel's leading edge enclosed in neatly faired, open-end mounts. The oil tank is located within the wing between the two spars of the center section. The unique Bristol exhaust collector ring in which it forms the leading edge of the engine cowling is fitted with the exhaust stacks located on the starboard side of each nacelle. The cowl is also fitted with hydraulically operated cowl flaps which regulate the flow of cooling air around the cylinders and provide for fast climbing and ground idling. The engine mount is of chrome-molybdenum steel tubing with standard Bristol duraluminum mounting ring with split segment at the bottom to facilitate rapid removal of the engine without disturbing the carburetor when it is desired to remove the motor from the motor

mount. The three-bladed propellers are DeHaviland Hydromatic (Hamilton Standard license) full-feathering constant-speed all-metal designs. These are covered with large de-icer cones when operation service demands the installation of de-icer equipment. The engines are supercharged with the latest design two-speed supercharging equipment.

CREW COMPARTMENT.—The pilot is located in the extreme nose of the Beaufighter with an astounding field of vision all about him. Entry into his compartment is gained through a hatch beneath the fuselage between the center section spars. A segment wheel type control is provided on the elevator and aileron control column, standard British practice. Buttons on the wheel control the fire of the forward guns; a selector panel selects the gun or guns to be fired. The gunner is located atop the fuselage aft of the wing trailing edge and is fully enclosed in a streamlined glass housing. Provisions have been made for installation of the powerful Frazer-Nash four-gun turret which gives a withering blast of fire rearward. The portion of the fuselage between the pilot and rear gunner is open and in case of emergency, the gunner may move forward and take the controls.

ARMAMENT.—The Bristol Beaufighter is, without doubt, the most heavily armed airplane now in the war. Within the shallow nose are installed FOUR British Oerlikon 20 millimeter aerial cannon mounted in pair on either side of the center line. They have a rate-of-fire of 150 rounds per minute each of the one pound shells, any one of which could blast an enemy plane fitting to pieces. The wing guns consist of six Browning machine-guns mounted in the following fashion: four in the leading edge of the starboard outer panel far outboard of the oil cooler; two in the leading edge of the port wing, the other (outboard) two having been replaced by the double-bulbed landing light emplacement. These guns are capable of firing 1,200 rounds per minute each. There are five hundred rounds of ammunition for each of the machine-guns and 250 rounds of ammunition for each of the aerial cannon. These guns are all electrically controlled by a selector switch located on the pilot's instrument panel and controlled by buttons on the wheel. Actually, there are only two buttons, one on each side of the wheel, one controlling the

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Terminal Clips 1/4"	10c val.	4—8c
Gas Funnel, Alum. strainer	25c	
Spacemats, Tubing 1/8"	3 ft.	10c
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Model Pins 1/2 or 1" 100 for	5c	
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Ball Bearing Washer 10c val.	5c	
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Washers, pinhole, 1/4, 1/8, 2 doz. 3c		
Prop Shafts, doz sm. 6c. large	10c	
Nose Pumps for 3c, 1/2—3/4, 3/8	6, 1 1/4	

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2x3	69c ea.
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cannons, the other controlling the machine-guns. The selector switch is set to fire either the left or right wing guns or all together, as is the switch for the cannons. In addition to this forward fire power, the Beaufighter is equipped for a multi-gun rear turret which would give it a total machine-gun installation of TEN and FOUR aerial cannon, the most concentrated fire-power now on wings! And, in addition, bomb racks may be fitted to the broad center section when it is desired for the Beaufighter to carry out light bombing missions.

EQUIPMENT.—The Beaufighter has complete radio receiving and transmitting equipment installed in the fuselage aft of the cockpit and handled by either the pilot or the gunner, duplicate controls being installed. Other items of equipment include navigation, identification and formation-keeping signal lights, landing flares installed in vertical cans in the aft fuselage section, automatic recognition device within the upper portion of the nose compartment and a cine-gun-camera installation. This is installed in place of one of the wing guns when photographic evidence of battles or missions is requested. Stowage is also available for navigation equipment such as computers, maps, a small desk, instruments, etc., fire extinguishers, complete oxygen equipment for the pilot and gunner, first-aid kit, emergency rations and an axe in the event of a crash landing and a member of the crew or item of equipment is pinned in the wreckage, or for cutting through heavy underbrush. Provisions have also been made for installing a four-gallon water tank for use if the ships are consigned to the African desert region. The emergency rations are stowed under the gunner's seat. Also installed are the heating system in which cold air is taken in through a duct,

heated by the warm engine exhaust manifold and routed to the cabin by a mixing valve through which any desired temperature may be maintained. The recently perfected Lorenz beam landing approach equipment is also installed for blind landings and difficult night landing conditions. The electrical system is of the 24 volt type taken from the battery located within the fuselage on the floor for ease of access from the ground. All cables and controls as well as fuel, oil and hydraulic lines are installed in the wings' hollow leading edges.

GENERAL.—The wing of the Beaufighter is the same as the Blenheim's. However, the Beaufighter has a designed load eighty percent greater than the earlier Bristol, and yet the wing weight is only 14 percent greater. The torsional stiffness is increased by seventy percent and production time cut fifty percent. An interesting detail of the Beaufighter is the installation of a new-type emergency escape hatch, located beneath the fuselage between the wing spars in such a manner that the door opens at right angles to the airstream, thereby providing a region of dead air behind which the pilot and gunner can fall free of the ship without danger of striking any portion of the machine, an accident which has befell many a pilot in recent air action.

DIMENSIONS.—The Beaufighter has a wing span of 57 feet 10 inches, is 41 feet 4 inches long. Obviously it is a large airplane, the largest purely fighting machine yet designed. It stands 15 feet 10 inches high when in level flight position to top of rudder. It has a wing area of 451 square feet net and a gross wing area of 503 square feet. Its tapered wings have an overall aspect ratio of 6.66 to 1, ideal for aerodynamic design.

WEIGHTS.—The Bristol Beaufighter

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PERFORMANCE.—All of which leads us up to the one big question: How good is the Beaufighter? Here, is the answer: It has a top speed of 336 miles per hour at 14,500 feet, this for an airplane weighing 10½ tons and having a wing span of almost 60 feet! It has a range of 1,500 miles at 200 miles per hour at 15,000 feet. It has a rate-of-climb of 1,850 feet per minute from the ground and 1,450 feet per minute at 15,000 feet. It can climb and fight at 28,900 feet and can be pushed to 30,000 feet when required. It lands at 73 miles per hour with the aid of flaps.

We have told you many times before that the airplane, particularly the military airplane, is a vast series of compromises; the finished design one great compromise between an hundred different and distinct objects of design. The design which emerges

from the factory with the greatest amount of each element is obviously the greatest airplane.

The Bristol Model 156, known to the Royal Air Force as the Beaufighter (The "Good Fighter" which it most certainly is), has combined into a single plane elements most desirous of a fighting plane: great and deadly fire power, high speed and long range. The Beaufighter is, then, one of the most outstanding airplanes ever developed, certainly the most outstanding developed in this World War II. Such, too, was the ancient, wire-braced FP-2B "Brisfit" of World War I, as deadly and superior an airplane as ever took the air against the flying Circus of the Imperial German Air Force of 1917-18. The Beaufighter is the latest of that same crew of directors, designers and workmen. It, too, should prove as superior to the planes of the 1939-41 Luftwaffe as the first Bristol good fighter was in its time. May its wings for democracy carry to victory the good fight on the smoking guns of this latest good fighter.

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How Good Is Russia's Airforce?

(Continued from page 7)

performance records and other data do not emanate freely; facts published are usually a few years old. When she speaks of aircraft production rises, these reports are published in percentages. One would have to know exactly what was produced at the very beginning of her aircraft program in order to accurately determine the mounting figures.

Such precautions bring to mind the foresight displayed by the Red military in guarding her secrets; and the "purges" of certain "high generals" "without whom the Red Army could not exist," seem justified, too, in light of the dangerous methods of "fifth columnists." The "liquidating" of high generals was indeed a blow to Hitler's espionage system! It is evidenced by the Red Army's stonewall resistance.

It was in Spain during the Civil war of 1936-37 that the performance of both Soviet fliers and their planes came to the attention of military observers. Much, too, had been written by the anti-Soviet press of the inferiority and little value of Soviet assistance to the Spanish Republican government. But anybody who was in Spain will tell you otherwise. They will never forget (neither will the Nazis) that great day in Madrid when Soviet *Chatos* and *Moscas* lay waiting in the clouds for the daily bombing of that city by the Fascist fliers and Nazi Luftwaffe; and how suddenly twenty-seven Nazi planes came tumbling down out of the skies after their encounter with Soviet airmen. From that day on the mastery of the air belonged to the Red aviators. The Messerschmitts and Junkers, Savoias and Fiats fled in mortal terror from the snub nose Soviet fighters. At the news of this first great air encounter, even the hostile *Paris Soir* conceded the fact that the speed of the Russian "Katiushka" light bombers were at least fifty miles an hour faster than the Nazi's Junkers bombers.

Conversely, it was also noted that the machines flown by the Soviet airmen bore marked resemblance to certain outdated models manufactured in the U.S.A. Their *Chato* single seater fighter designated I-15 was a gull winged craft powered with a "beefed up" Wright Cyclone of about 650 h.p. Fast and extremely maneuverable, observers described it as being a blending of designs between a Laird Super-Solution and a Curtiss "Sparrowhawk." It had a top speed around 225 m.p.h.

Another fighter which performed well was the *Mosca* which was powered with 735 hp. Cyclone and had a top speed better than 280 miles an hour. Short and stubby, it bore the earmarks of a combination Boeing P-26-A and Seversky fighter design. It had a retractable landing gear (the P-26A had streamline legs and wheel pants). The cockpit was moved to the center of the fuselage. Tapered wings had broad fillets at the roots. Armament consisted of two 50 and two 30 caliber machine guns mounted beneath the fuselage cowling and in the wings.

The medium bombers were twin engined ships whose ZKB-26 designation was better known in Spain as the "Katiushka" and it proved to be the best bomber on either side. This machine had twin 1000 hp. M-85

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This is a special de luxe solid model. Set has completely finished balsa fuselage, cockpit cut out, routed pants, wings cut to shape, 1 1/2" de luxe cast motor, alum. cowl, 3 bladed cast prop, paints, drawing and all parts. Set p.p. **\$1.50**

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22 1/2" Span. Length 14 1/2". 3/4" Scale.

Set has 3" celluloid motor, 3 1/4" tapered aluminum cowl ring, set of paints, etc. **\$2.95** Postpaid

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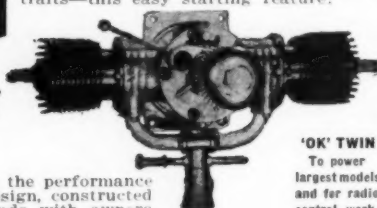
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Gnome Rhone engines, was armed with two machine gun turrets and two mounted wing guns. With full bomb load of 6600 pounds its top speed was 315 miles an hour.

A modification being used in the current conflict is an improved design with neatly cowled in liquid cooled engines and is several miles an hour faster. Another twin engined bomber bearing ZKB initials is a cross study of our Martin 166 and Douglas B-18. It is powered with twin Gnome Rhone engines of 1000 hp. each. A modified job of this model made the transAtlantic flight from Moscow to New York but cracked up on an island in New Brunswick, Canada, a few years ago.

The success of the Soviet aircraft industry can be partially attributed to the assistance given by the U.S. both in engineering service and methods of manufacture. The Soviet aero industry did not chose to adopt European manufacturing methods and sent a corps of its best aeronautical engineers to make detailed studies of our manufacturing and production technique.

They were allowed to purchase manufacturing rights from Vultee, Seversky, Wright aircraft engines and sample models of a Douglas flying boat, some Douglas DC-2's, Martin Bombers, Vultee V11-GB's and Consolidated PB-Y's.

The feeling in this country at the time of the Spanish conflict was intense and to many it was a tragedy that an embargo should be placed against sending aircraft to the Spanish Republican Government for which they were ready to lay cash on the line. Whatever the feeling though, the stockholders of certain aircraft companies

benefited from the Soviet Union's help to the Republican Forces, limited as it was.

On the basis of a thorough study of American methods and forms, the Soviet Union developed her aero industry to such technique that, according to several neutral observers it has since outdistanced its American model in quantity production!

Let us examine some figures—figures estimated by impartial observers whose opinion on aeronautical matters are highly regarded.

In an official report made public by the French Air Commission which visited the USSR's aircraft manufacturing facilities during the Summer of 1936, it was stated that there were between 200,000 and 250,000 trained aircraft workers employed. This report, a submittal by such eminent leaders in French aircraft production such as Breguet, and Potez, and Bossouret, Chairman of the Air Commission, added that many of the employees were working in plants operating on a three shift basis.

Breguet was amazed at the rationalization and mass production technique which seemed to him, almost incredible. Here, Soviet aircraft plants were turning out machines, and good ones, on moving bands like his native France was turning out motor cars!

Other reports stated that five big Russian factories had turned out between 4000 and 5000 military planes in 1936. Mind you, this was almost six years ago—while the United States was barely producing 500 planes a year. And at that, only when certain companies received government contracts.

According to the German sources—whose information figures on what other countries have and can do are surprisingly accurate, it was revealed that the Soviet air strength in 1938 was about 8000 first line ships! The question of quality remains.

Regardless of political feelings, military observers credited the Soviet planes and air force in class A condition. It had abundantly proved this contention in the Spanish war of intervention—and which was later proven in the Russo-Finnish affair. In addition, the quality of Soviet aerial bombs astonished all foreign experts for their effective area of their explosive force.

In June, 1940, Arthur Nutt, President of the American Society of Automotive Engineers and Vice-President of the Wright Aeronautical Corp., said that the Soviet Union was geared to turn out well made planes and American type engines on a larger scale than his own country was then doing.

He told of his visit a year before to a Soviet plant equipped to turn out on production line basis 10,000 aero engines a year. He was impressed with the very thorough job which was being done in the manufacturing of the 1200 hp. Wright Cyclone engines being built under license.

"Soviet planes, both in construction and performance, are up to American standard," said Mr. Nutt. "Their institutions and shops for research and study are equal in quality and far surpass in size anything abroad . . . because they have the whole resources of the State at their disposal. Engineers and designers have an opportunity for experimental work that no private company could afford." A very revealing statement which makes one wonder now on what basis Lindbergh formulated such derogatory conclusions on the Soviet Air Force. Lindbergh on his visit to the Soviet capital was accorded unusual privileges in inspecting the aircraft factories.

Here is a story of proof which gives strength to the Soviet's Air Force anti-aircraft divisions.

The Associated Press dispatch from London of August 6 to American papers and giving the testimony of "an aviation authority" on the quality of the Red Air Fleet went a long way toward nailing another lie of Soviet "inefficiency."

This British expert, whose name was not given but whose truthfulness is considerably more apparent than Col. Lindbergh's or Al Williams' declared that the Red Air Fleet is in complete control of Moscow. He went on to say that he was dispatched to Moscow on the authority of the British government to teach the Soviet defenders something about air defense of cities in danger of being bombed.

"Teaching the Russians air defense is like trying to teach the New York Yankees baseball," he laughed. They were better at defending Moscow, he implied, than the British were at defending London!

"I've spent nights in London during some of the worst raids," he said, "and I've spent some in Moscow. There is no comparison. The Nazis simply don't get through this wall of superfire put up by the Soviets."

Colonel von Bulow, air expert, wrote in a Nazi military journal in 1937 that: "Russia is the only European State which is unlikely

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to be attacked effectively from the air owing to the enormous extent of her territory. The vastness of the country, the comparatively low density of its population and the fact that its war industries and governmental and administrative centers are far away from the frontiers afford it a certain amount of natural protection from air attack despite the increase in range of the modern bomber. From the standpoint of defense therefore, the air situation of Soviet Russia could not be more favorable. Soviet Russia which at the present stage of aviation technique need have no fear of its air security."

From the pen of Max Werner, author of *Military Strength of The Powers*, who is by no means friendly towards the Soviet Union but considered a brilliant military analyst, puts forward: "The production of airplane engines in the USSR is far greater than the production of aircraft both absolutely and relatively. Four chief types of aero engines are produced. They are: Hispano Suiza, Gnome et Rhone, the Wright Cyclone and the Soviet AM-34. The last named is considered to be the most powerful engine in Europe. It develops 1250 hp. The factory producing the AM-34 produced no less than 20,000 during 1936 according to the report of the Vice Chairman of the French Air Commission." If this statement is true, what did the U. S. have to offer in the way of high horse power engines in 1936? Answer: Nothing! Just a lot of bugs to be worked out!

Again, from the pen of Werner: "The productive capacity of the Soviet aero industry is sufficient to permit even considerably higher levels. The actual strength of the Red Air Force is determined by the production program of the aero industry, by the Soviet war plans, and by the technical and strategical performance the military leaders of the Soviet Union will demand of it.

"It is hardly possible to put any limits to the maximum productive possibilities of the Soviet aero industry. It is undoubtedly capable of reaching the highest possible levels of our day in regards to quality and quantity."

Von Bulow wrote in 1935:

"The necessary basis for war production in the aero industry must be laid in time of peace by a planned economy of positively prophetic foresight. In this connection those countries which are economically dependent on foreign sources either in matter of productive preparedness or of raw material supplies, are at a disadvantage as compared with those countries which are economically self-sufficient. Today there are only two countries in the world which are completely economically independent and in a position to produce airplanes and aviation engines on a mass scale indefinitely, namely Russia and the United States."

Again in 1935 Colonel von Bulow wrote in the organ of the German War Ministry: "In recent years the air force of Soviet Russia has been strengthened to such an extent that it is now the strongest in the world. It forms the core of the whole military strength of Soviet Russia."

In December, 1936, the USSR embarked on a program to train 150,000 war pilots. The Russian seismograph was recording faint rumbles of war and they pursued this aim with great vigor and determination.

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The first contingent of this new vast air army was reported to have completed their training at the end of 1937 and the beginning of 1938. From this aim, experts conclude that the Red Air Force would wage warfare with between 12,000 and 15,000 machines, and that to every active pilot there would be five trained reserves.

Two competent authorities go beyond this estimate. The Nazi *Wehrmacht* military journal put the strength of the Red Air Force at between 15,000 and 17,000 machines for 1937. The Prague organ of the Czech Agrarian Party "*Venkov*," estimated on the basis of former strength figures and the latest increase of production in the Soviet Union that the strength of the Red Air Force would be about 16,000 machines in the middle of 1938. What other country

in Europe or anywhere else in the world for that matter, could claim such numbers? Probable enemies do not delude themselves into false security by admitting such military might.

Accordingly, European experts are of the opinion that the R.A.F. is by far the strongest in the world not only numerically but also in the matter of quality. Numbers and first class technique complement each other in the R.A.F., and the Soviet aero industry is served by the most up-to-date progressive laboratory work.

Von Bulow again stated in the official Nazi journal: "There is probably no other country in the world which has such a network of experimental stations, laboratories and training centers, and all their efforts are exclusively directed to developing the



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Soviet air arm to the highest possible level of technical perfection." Pierre Cot, former French Air Minister agreed on this point, too.

In 1932, the R.A.F. was the only power which had heavy bombers in mass numbers. In the years of 1935 to 1937 the entire air force was reorganized and re-equipped.

Major Frederic Lord, an American war ace who destroyed 22 enemy planes in the first World War, and who added another 13 victories to his old score during the Spanish Civil War, described the qualities of the Soviet airplanes in which he fought and flew, in the January 18th, 1937, edition of *Le Journal* (Paris) as follows:

"Their bombers are veritable flying fortresses; they are so fast and so difficult to hit that they can carry out raids without being accompanied by fighter planes to protect them. As far as the Soviet fighter planes are concerned, they are in my opinion superior to the corresponding planes sent to Spain by all other countries."

Agreeing with Lord were two French engineers, experts on aircraft construction and performance. One had served with the Franco forces and the other with the Spanish Republican forces. They agreed (their evidence was published in the form of a memorandum in the *Paris-Midi*) that the Soviet airplanes in Spain had proved themselves far superior to all others. This opinion was shared by several French reactionary journalists, also experienced in military matters.

The opinion of Gen. Armengaud, probably the foremost French authority on air warfare was equally decided on the point: "Thanks to their better quality the Soviet airplanes compensate in some measure for the insufficient numerical strength of the Spanish Republican Air Force."

As an indication of Soviet pioneering and foresightedness, take the effectiveness of the technique of "vertical surrounding" or use of parachute troops developed by the Soviets. The first use of this branch of their air arm occurred in 1931—ten years ago—against a band of marauders in Central Asia. They were caught pronto and mopped up.

During maneuvers in 1935, before for-

eign observers, whole brigades with their artillery and light tanks were dropped from the skies. The Germans caught on quickly and have since used it effectively, too. The United States first began with paratroops in 1940. The British tried it in Southern Italy not so long ago but the details were never fully divulged.

The Red Air Force is based upon a preponderance of bomber craft rather than fighter although the latter are not neglected. Russia has equipped herself to also carry the air war to the enemy—for her counter-offensive tactics have been fully worked out in theory and practice. The commander of the Red Air Force is 39 year old Lt. Gen. Jacob Schumushkevich, a Ukraian Jew, an aerobatic champ, and who at 19 was Political Instructor of Aviation in the USSR—and now, no doubt, a thorn in Hitler's side.

As mentioned previously, it has been practically impossible to get any accurate data concerning the models and performance of the latest fighting craft of the Red Air Force. Whether the R.A.F. is fighting with what some opine to be antiquated aircraft or the most modern stuff, remains to be seen. But whatever, it has been clearly demonstrated that the vaunted Nazi Luftwaffe, after weeks of all out effort, have failed to gain superiority over the Red Air Force.

The following, according to the writer's source of information is as much available information on a representative number of types as may be obtained. The data has been corrected up to January of 1940. It goes without saying that performance figures listed here have been far surpassed and that the details on Russia's latest fighting craft are simply unavailable. Reports from reliable sources, however, say that their low wing fighters and bombers stack right up with the best England, Germany and the U. S. has to offer.

Fighter Planes

In the fighter category, the ZKB (initials for Z. K. Borkovsky) is among the world's finest. First used in Spain, it has since been proved both in construction and speed attainment as well as armament installation. Early models were powered with "suped up" Hispano Suiza engines of 1300 hp. It had four forward firing guns located in pairs in each wing panel and a 20 mm. cannon firing through the nose at the rate of 1000 rounds per minute. Top speed was better than 300. It had a cruising speed of 260 m.p.h. Service ceiling was 32,000 feet and its rate of climb was 3,400 feet per minute.

In appearance it was roughly similar to the British Spitfire.

The latest model ZKB I-20 is reported to be about four miles an hour slower than the best Nazi single seater fighter—the Heinkel 113. It does 378 miles an hour and is armed with a 20 mm cannon, two 50 caliber and four 30 caliber machine guns. Its Hispano engine develops 1300 hp.

The I-18 is a single seater monoplane powered with a 1250 hp. Mikoline liquid cooled engine. Top speed is 340 miles an hour and armament includes six guns of mixed caliber.

The Mosca is still being used but has since undergone certain revisions. Its 750

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hp. M-25 engine (a modified Wright Cyclone) has been "beefed up" which now gives it a speed of 280 miles an hour. It's extremely sensitive on the control action and is armed with two 50 and two 30 caliber machine guns. The Mosca lands at 97 m.p.h. Recent photographs from the war front have shown this model to be used as a dive bomber.

Included in the dive bombing category are several Vultee V-11GB's and a recent fast job modeled along Vultee lines said to be plenty hot.

Bombers

Newest medium bomber types are secretive. However, they bear resemblance to our Douglas airliners but on a somewhat smaller scale. These ships are powered with liquid cooled engines and are armed with "heavy caliber" cannon as well as machine guns.

The best Soviet airliner is an almost identical copy of our Douglas DC-2, is powered with radial engines (Wright 1000 hp.) and has a speed of 248 which is better than our own. Its bomber counterpart also used as a troop transport has liquid cooled engines and is reported to be much faster.

Russia's heavy bombers are several miles

an hour slower than Hitler's but possess as great a range and carrying capacity.

Most widely used and a bit on the older side, is the TB-3, a mid wing job with a queer overhanging nose. Four 950 hp. M-34 engines carry it along at 220 miles an hour with its full load of 11,300 pounds of bombs. Its cruising speed is about twenty miles an hour less and it is armed with two gun turrets and three gun emplacements. Range is 3700 miles.

DB-3, a late model medium bomber, has top speed of 245 m.p.h. It carries 3300 pounds of bombs 1600 miles.

I-15, a single seater biplane (late war newsreels show these ships in action) looks like a Boeing biplane fighter, (on the heavier side) with enormous wheel pants. Good climb and get away performance but a top speed of only 223 m.p.h.

DI-6, a two seater biplane with six machine guns, four fixed and two flexible, is used for ground strafing and night fighting. It is rapidly being replaced by a much faster model armed with a cannon specially designed to pierce tank armor.

Several versions of American made Consolidated and Douglas twin engined flying boats are seen here and thereabouts. These ships are powered with Wright engines and have controllable pitch props also built under license.

The navigational instruments are all of Russian make and reputed to be among the finest in the world. Their long distance flights proved it.

Naturally some of the models listed above have been superseded with faster versions. Our patience will simply have to outlive this war so that when right triumphs over Nazi might, we shall know more about its accomplishing factor.

Every pilot in the Red Air Force must have both pursuit and bombing plane experience in order that he may better understand what he will be up against when encountering enemy aircraft. All observers and gunners must also know how to pilot the plane in which they fly as crew members. In other words every man in the air over the USSR is a pilot!

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Model Designing Simplified

(Continued from page 11)

established by aerodynamic requirements, and then the actual C.G. is made to coincide with it by locating movable weights as required to give correct balance. The C.G. should be directly under C.L. and in respect to its location in a vertical sense. Best results, aerodynamically, are obtained if it is on or slightly above a line X-Y drawn parallel to the thrust line through the C.L.A. However such a location is not always possible and sometimes not advisable for other reasons. Its final position is usually a compromise. In fig. 3 it is slightly below X-Y because longitudinal stability results from placing it not less than 1/10 the chord below L.T. However it may be slightly below X-Y without serious results provided a line D-A through C.G. and C.L.A. does not form an angle with X-Y greater than 5 degrees. This is the maximum tolerance, and the condition existing in the case of the Rearwin, so mark the C.G. position on the layout as shown in fig. 3.

If it is found that the angle between X-Y and D-A is greater than 5° one of two things may be done. First the thrust line L.T. may be given a negative slant (down thrust) so the angle between X-Y and D-A is not more than 5°, but this down thrust angle should not be greater than 3°.

If down thrust is used the angle of the wing and stabilizer chord lines C-C and S-C must be changed also, so that their original angle with the thrust line is retained. If 3° down thrust is required, then wing chord C-C' should make an angle of 3° with the new thrust line; 3° less than the original angle of incidence. The sta-

bilizer chord line angle should be reduced 3° also, thereby retaining the original difference in angle between the two chord lines.

The new setup based on the original L.T. then would be: new thrust line 3° negative, wing chord 0° and stabilizer 2-1/4° negative.

If changing the angle of the wing distorts the scale appearance of the plane then the only recourse is the second possible procedure: namely, raising the C.G. so angle between X-Y and D-A is not more than 5°; disregarding its position relative to L.T., because the C.G. position relative to line X-Y is much more important than its relation to the line of thrust, L.T.

The only remaining step now is to draw in the line of resistance L.R. This usual-

ly lies about half way between C.L. and C.G. as shown in fig. 3.

When this is done make a complete layout on paper of the plane side view and indicating on it the force positions and centers of reaction; transposing them from the cardboard pattern layout.

The Rearwin makes an excellent flying scale gas model but any other large plane, "dream ship" or contest model may be laid out in the same way:—First locate the C.L.A. of the side view, then the C.G., wing down thrust if required, in order to bring the C.G. close to a horizontal line through C.L.A.

Next month the design of the simple contest model will be continued from article 11.

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for Beginners and Experts



NO transport pilot would take to the air without a flight plan, or attempt a landing without tuning in on the airport signals. When he is "on the beam," a pilot knows it by a hum—steady and unfaltering—in his ears.

OHLSOON owners also know the hum of dependable motor performance—and what it means in contest victories!

When, on the other hand, a pilot is off the beam on one side, he hears a dot dash (A). If he goes too far on the other side, he hears a dash dot (N).

When their motor performance is "off the beam"—dashing and dotting and stuttering like a teakettle—model builders get "off the beam" and start "cooking with steam," too.

The point is that first quality on-the-beam motor performance is the best flight plan for any modeler, beginner or expert. And every modeler knows that that's what an Ohlsson delivers.

NO WAITING LIST! NO DISAPPOINTMENTS!

In spite of the highest sales and production in our history, there is no delay in delivery of Ohlssons. You can buy any one or all four of these "four-most" contest motors at your dealer's today. Purchases of raw materials far in advance of requirements, plus the fact that Ohlsson & Rice make all their own parts (exc. plugs) and are therefore not held up by the failure of outside suppliers, make this possible. No disappointments in performance—no delay in delivery. Pick your Ohlsson now.

America's Four-Most Contest Engines

OHLSOON 60 Custom.....	\$21.50	OHLSOON 23.....	\$16.50
OHLSOON 60 Special.....	\$18.50	OHLSOON 19.....	\$14.50

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